

**FINAL
REMEDIAL ACTION PLAN**

FOR

**INVESTIGATION AREA E
MARE ISLAND NAVAL SHIPYARD
VALLEJO, CALIFORNIA**

JUNE 29, 2000

**Prepared by
California Environmental Protection Agency
Department of Toxic Substances Control
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ABBREVIATIONS AND ACRONYMS

ACM	Asbestos containing material
AST	Aboveground storage tank
bgs	Below ground surface
BRAC	Base Realignment and Closure
BTEX	Benzene, toluene, ethylbenzene, xylene
CERCLA	Comprehensive Environmental Responsibility, Compensation and Liability Act
CFR	Code of Federal Regulations
DFG	Department of Fish and Game
DoD	Department of Defense
DOM	Domestic pumping station
DTSC	Department of Toxic Substances Control
EBS	Environmental Baseline Survey
EFA WEST	Engineering Field Activity West
EPA	Environmental Protection Agency
IAS	Initial assessment study
IR	Installation Restoration
LBP	Lead-based paint
mg/kg	Milligram per kilogram
MINS	Mare Island Naval Shipyard

NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NFA	No-further action
PA/SI	Preliminary Assessment/Site Investigation
PCB	Polychlorinated biphenyl
Ppm	Parts per million
PRC	PRC Environmental Management, Inc.
PRG	Preliminary Remediation Goal
PWC	Public Works Center
RAP	Remedial Action Plan
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
RWQCB	Regional Water Quality Control Board
SARA	Superfund Amendments and Reauthorization Act
sq. ft.	Square feet
SSPORTS	Supervisor of Shipbuilding Portsmouth Environmental Detachment
SWMU	Solid Waste Management Unit
TPH	Total petroleum hydrocarbons
TTEMI	Tetra Tech EM Inc.
UST	Underground storage tank
UXO	Unexploded Ordnance

EXECUTIVE SUMMARY

This Remedial Action Plan (RAP) has been prepared for Investigation Area E, Mare Island Naval Station (MINS), Vallejo, California ("the Site"; see Figure 1-1). The RAP has been prepared in accordance with California Health and Safety Code Chapter 6.8 and consistent with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), Section 300 (USEPA, 1990).

As presented in this RAP, the primary objective of the remedial action is the protection of human health and the environment. Based on the future recreational land use scenario, remedial action is recommended to address the presence of arsenic in soil resulting from historical use of the Site. This RAP presents an evaluation of remedial action alternatives and identifies the selected alternative for implementation at the Site.

Within Investigation Area E, the United States Navy (US Navy) historically has operated a 9-hole golf course, ordnance storage magazines, pump stations, barracks and latrines, radio-arc powerhouse, and has conducted various maintenance activities. Concentrations of lead and arsenic in excess of background levels were detected in soil samples collected at the Site.

The California Environmental Protection Agency (CalEPA), Department of Toxic Substances Control (DTSC) has indicated that the potential presence of the elevated metals requires a remedial action. Tetra Tech EM, Inc. (TtEMI) has performed risk-based evaluations to identify remedial goals that would be protective of public health. Remedial cleanup goals were developed based on recreational land use at the Site. Remedial cleanup goals incorporated the U.S. Environmental Protection Agency (USEPA), Region IX, Preliminary Remediation Goals (PRG) screening methodology (USEPA, 1998) and the CalEPA Risk Assessment Spreadsheet, LeadSpread (DTSC, 1992). Based on these evaluations, remedial cleanup goals were developed for the Chemicals of Potential Concern (COPCs).

To achieve the remedial cleanup goals, the following five potentially applicable remedial technologies were evaluated: "no action," institutional controls, soil treatment, capping soil in place, and excavation. These five technologies initially were screened using three criteria:

technical effectiveness, implementability, and cost. The technologies and combinations of technologies that survived the screening were then evaluated using the two threshold criteria and five modifying criteria established in the NCP (USEPA, 1990).

After this initial screening, the following remedial action alternatives were evaluated: Alternative 1 - "No Action" (required by the NCP), Alternative 2 - Institutional Controls, Alternative 3 - Capping with Institutional Controls and Alternative 4 - Excavation and Disposal. The recommended remedial action alternative was selected by evaluating each alternative using the nine criteria as identified in the NCP.

Implementation of Institutional Controls (Alternative 2) is the recommended remedial action alternative for the Site. Institutional controls are remedies that rely on non-engineering legal measures that prevent or limit exposure to hazardous substances, pollutants, or contaminants by restricting water and/or land use. In Alternative 2, proposed for implementation at the golf course portion of Area E, the institutional control would prevent unacceptable exposure of residential users to concentrations of arsenic in soil that would pose an unacceptable risk to human health in a residential setting. The institutional control prohibits residential use of the contaminated area, as well as use for schools or hospitals. Alternative 2 would be technically effective. It would be protective of human health and the environment and would comply with applicable regulatory goals and requirements; it would provide permanence, long- and short-term effectiveness; and it would address chemical mobility by specifying conditions for handling arsenic-affected soil. Alternative 2 would be implementable. It would use conventional technology, and would achieve the acceptance of regulators and the community. Alternative 2 also would be cost-effective. It has been estimated to cost approximately \$18,000 (Table 6-2), which would be less than the cost of other alternatives providing a similar or lower level of effectiveness.

1. INTRODUCTION

This Remedial Action Plan (RAP) has been prepared for Investigation Area E (IA-E), Mare Island Naval Shipyard (MINS), Vallejo, California (“the Site”, see Figure 1-1). In accordance with the Federal Facilities Site Remediation Agreement (September 29, 1992), Naval Facilities Engineering Command, Engineering Field Activity West (EFA WEST) is responsible for completing remedial investigations and cleanup at MINS. IA-E is located at the southern end of Mare Island (see Figure 1-2). A legal description and an accompanying plat map is provided as Appendix A. Current and recent past land uses of IA-E include a golf course, ammunition storage bunkers, a former small firefighting water reservoir also known as the ordnance reservoir, and open space. Since 1983, remedial investigations and environmental evaluations have been performed within IA-E as part of the Base Realignment and Closure (BRAC) process. The reuse plans propose that IA-E be redeveloped for recreational land use, including expansion of the existing 9-hole golf course to an 18-hole golf course.

Remedial Investigations (RI) have been conducted that have identified the potential presence of chemicals that require the preparation of a Remedial Action Plan (RAP), and implementation of a remedy. This RAP presents a summary of the remedial investigations, human health and ecological risk assessments, remedial technology screening and remedial alternative evaluations, as well as a proposed remedy. The RAP is organized as follows:

- Site description and background (Section 2.0)
- Summary of remedial investigations (Section 3.0)
- Development of remedial action goals and objectives for the proposed recreational land use (Section 4.0).
- Identification and screening of remedial action technologies for the proposed recreational land use (Section 5.0).

- Evaluation of potential remedial action alternatives for the proposed recreational land use (Section 6.0).
- Recommended remedial action alternative for the proposed recreational land use (Section 7.0).

2. SITE DESCRIPTION

2.1 SITE LOCATION AND DESCRIPTION

Mare Island is located in the City of Vallejo, Solano County, California, approximately 25 miles northeast of San Francisco, see Figure 1-1. The island is approximately 3.5 miles long and 1.25 miles wide, covering approximately 5,500 acres, of which about 1,196 acres is developable land, formerly occupied by the Mare Island Naval Shipyard (MINS, see Figure 1-2). Mare Island was operated as a naval facility from 1854 to 1996 (TtEMI, 2000c).

MINS was scheduled for closure in accordance with the Defense Base Realignment and Closure Act (BRAC) of 1993. Most of the facility will eventually be transferred to the City of Vallejo for civilian use. In order to manage the transfer of property to the City, MINS has been divided into Investigation Areas (IAs), the boundaries of which roughly coincide with the City's identified reuse zones. Investigation Area E (IA-E) is located at the southern end of Mare Island (see Figure 1-2). A legal description and an accompanying plat map are provided as Appendix A.

Based on land use, IA-E has been divided into two sectors: the upland magazine area and the golf course area. The upland magazine area was used from approximately the mid-1930's until 1973. This area covers approximately 140 acres and currently consists of approximately 85 structures, ammunition bunkers, a small firefighting water reservoir also known as the ordnance reservoir, and open space. Two ammunition bunkers in the upland magazine area were designated as Installation Restoration Site 22 (IR 22). The existing golf course covers approximately 90 acres and consists of a 9-hole golf course, two buildings, and two water tanks (see Figure 1-3).

2.2 INVESTIGATION AREA E PROPERTY DESCRIPTION

For the purpose of the Basewide Environmental Baseline Survey (EBS), MINS was divided into 126 distinct parcels for classification based on environmental condition of real property. The upland magazine area is located on EBS Parcels 11-A3, 11-A4, and 11-A1, and a portion of 12-

A5. The golf course area is located on EBS Parcels 11-A1 and 11-A5. A description of the subject parcels is presented below.

2.2.1 Parcel 11-A1

Parcel 11-A1 covers 81 acres and comprises two buildings, two water tanks (Freshwater Tanks 188A and 188B), and open space associated with the golf course, including landscaped grass, a freshwater reservoir, and asphalt roadways.

2.2.2 Parcel 11-A3

Parcel 11-A3 covers 58 acres and comprises fifteen buildings, open space, including grass and brush, and asphalt roadways.

2.2.3 Parcel 11-A4

Parcel 11-A4 covers 6 acres and comprises three buildings, open space, including grass and brush, and asphalt roadways.

2.2.4 Parcel 11-A5

Parcel 11-A5 covers 2 acres and comprises two buildings, a water tank, and open space associated with the golf course, including landscaped grass, asphalt roadways, and parking areas.

2.2.5 Parcel 12-A5

Parcel 12-A5 covers 32 acres, about 12 acres of which are included in IA-E. There are five buildings on the portion of the parcel included in IA-E, while the remainder of the parcel is open space, including brush, landscaped areas, and asphalt roadways.

2.3 SITE TOPOGRAPHY

The topography of the western portion of the upland magazine area (EBS Parcel 11-A3) is hilly, with vegetation comprising primarily grass and brush. Elevations range from 35 to 135 feet above mean sea level (msl). The southern portion of the upland magazine area (EBS Parcel 12-A5) is steeply inclined, with slope grades ranging from 8 percent to 25 percent. Vegetation primarily consists of coastal prairie and scrub with some trees. Elevations in the southern portion range from 60 to 280 feet above msl. Elevations in the golf course area range from 50 to 180 feet above msl (primarily EBS Parcel 11-A1), and the area consists of rolling hills, with grass cover and a few trees. Information regarding site topography and vegetation was obtained from individual parcel reports (TtEMI, 2000b).

2.4 SITE GEOLOGY AND HYDROGEOLOGY

The southern portion of Mare Island, where IA-E is located, includes an upland area underlain by sandstone and shale, surrounded by a narrow shelf of alluvium and filled land. The central and northern areas of Mare Island are formed from relatively thick alluvium and bay mud. The surface geology of IA-E is described as consisting of micaceous shales and minor thin sandstone beds of the Upper Cretaceous Los Osos formation. Loamy soils are present on slopes and Altamont Clay has been identified in some areas.

The elevation of groundwater in the western portion of the upland magazine area is reportedly approximately 25 feet above msl. Shallow groundwater flows radially towards the margins of the peninsula, towards the southeast. Based on site topography, groundwater flow in the eastern portion of IA-E is inferred to be towards Mare Island Strait. In the southern portion of IA-E, groundwater flow is inferred to be towards Carquinez Strait. Information regarding site geology and hydrogeology was obtained from individual parcel reports (TtEMI, 2000b).

2.5 WETLANDS AND SENSITIVE HABITATS

A small wetlands habitat is located adjacent to the freshwater reservoir in the golf course area. No sensitive habitats have been identified in IA-E.

2.6 POTABLE WATER

The City of Vallejo supplies potable water to IA-E for drinking water, fire suppression, and other uses. A 1994 survey for backflow protection and cross connections indicated a potential risk for contamination of drinking water at three buildings in IA-E. The IA-E buildings identified as being at risk were Buildings A188 and A189 on Parcel 11-A3 and Building 658 on Parcel 11-A5 (TtEMI, 2000b).

3. SUMMARY OF INVESTIGATIONS

Environmental conditions at MINS have been described in a number of previous reports. The primary focus of the initial studies was aimed at characterizing soil and groundwater conditions at historic waste disposal areas. These investigation programs were developed in conjunction with the Federal Facilities Site Remediation Agreement (FFSRA), the Comprehensive Long-Term Environmental Action Navy (CLEAN) contracts, input from the United States Environmental Protection Agency (USEPA), and the California Environmental Protection Agency's Department of Toxic Substances Control (DTSC) and Regional Water Quality Control Board (RWQCB).

3.1 REMEDIAL INVESTIGATION PROGRAMS

The remedial investigation (RI) program for MINS has been conducted as part of the Navy's Installation Restoration (IR) program. An initial assessment study (IAS) was conducted under the IR program in March 1983 (PRC, 1995). Based on a review of historical records, aerial photographs, personnel interviews, and field inspections, a list of 24 sites basewide was identified that posed a potential threat to human health and the environment. Subsequent evaluations conducted pursuant to the Federal preliminary assessment/site inspection (PA/SI) process identified additional IR Program sites.

For management purposes, sites at MINS were divided into five major groups. Group I consisted of sites addressed under the original Installation Restoration Program (IRP); IR22 is the only Group I site in IA-E. Group II and Group III sites (Group II/III) consisted of sites requiring additional remedial investigation; the domestic sewer system pump station 17 (DOM 17) and ordnance reservoir were the only Group II/III sites in IA-E. The fourth group is "Offshore Sites," of which none are included in IA-E. The fifth group is "Other Sites," which in Investigation Area E includes the golf course area.

In addition to the IR program, additional investigation programs have been implemented at MINS for contaminant specific screening programs including the following:

- Unexploded Ordnance (UXO),
- Polychlorinated Biphenyls (PCBs),
- Radioactive Materials,
- Underground Storage Tanks (USTs),
- Lead in Soil from Lead-based Paint, and
- Other Sites.

Table 3-1 presents a summary of investigations conducted within IA-E, chemicals of potential concern (COPCs), remedial actions, and where appropriate the regulatory status. The following presents a summary of the findings of the various investigation programs.

3.2 INSTALLATION RESTORATION (IR) PROGRAM

One of the twenty-four Installation Restoration (IR) Program sites was identified in the basewide EBS as being located in IA-E. The investigations conducted under the IR program identified the two ammunition bunkers A249 and A250 as IR-22. Reinforced concrete ammunition bunkers were constructed in 1942 and used to store ammunition, explosive devices, and pesticides. IR-22 was managed as Operable Unit 1 (OU1) for the purposes of remedial investigation (PRC, 1995).

3.2.1 IR-22

Observations of an unknown white powdery substance in 1989 prompted a cleanup and investigation at IR-22 in 1992. Following cleanup efforts, a Phase I investigation of IR-22 analyzed concrete chip samples for pesticides, metals, and nitrates. The samples revealed elevated concentrations of copper and lead in the concrete floor and residues of pesticides, including DDT (PRC, 1995).

Soil data used for the identification of COPCs revealed maximum concentrations of pesticides, including DDT and its derivatives DDE and DDD, at 0.059 milligrams per kilogram (mg/kg),

0.021 mg/kg, and 0.006 mg/kg, respectively. The Navy concluded that the white powdery substance observed earlier was probably not a pesticide residue. No other pesticide or explosive-related compounds were detected.

A Phase II investigation was performed in 1995 to assess conditions in the loading platform areas and drain spillways outside the bunkers. Concrete core and surface and subsurface soil samples were collected from within and beneath the structures, as well as from outside locations. The soil and concrete samples were analyzed for metals, hexavalent chromium, pesticides, PCBs, and explosive-related compounds. A risk assessment performed for IR-22 concluded that the chemical concentrations at IR-22 did not pose an unacceptable human health risk (PRC, 1995).

Investigation of the ammunition bunkers also revealed small lead tags in soil. The lead tags were used to seal containers of ordnance and likely were discarded after opening. Approximately 22 cubic yards of soil containing discarded lead tags was excavated from three areas around the two ammunition bunkers. In two locations, the soil excavation continued until an underlying asphalt surface was exposed, indicating that all soil potentially containing the lead seals was removed (PRC, 1995).

In 1996, additional soil sampling was performed in the upland magazine area. Surface soil samples were collected from outside former bunker sites, from within drainage ditches, and from open space areas. The samples were analyzed for lead and 17 other metals.

The results of the Human Health Risk Assessment (HHRA) for the upland magazine area concluded that there are no significant human health concerns associated with exposure to surface soil for the commercial and residential exposure scenarios evaluated (TtEMI, 2000a). DTSC approved the human health risk assessment as a final document in a letter dated March 7, 2000 (DTSC, 2000d).

Soil screening criteria were developed for metals to identify areas potentially posing a human health risk and to evaluate the effectiveness of remedial measures. Soil screening criteria for metals were the USEPA, Region IX, Preliminary Remediation Goals for residential soil (PRGs;

USEPA, 1998b). In addition, ambient concentrations of metals were developed for MINS to evaluate whether concentrations exceeded background conditions.

Maximum concentrations in soil of the metals arsenic, cadmium, and chromium were reported to be less than ambient concentrations established for MINS, while concentrations of beryllium, lead, and manganese exceeded ambient limits. Soil samples collected from IR-22 revealed maximum concentrations of lead at 300 mg/kg, manganese at 1,100 mg/kg, and beryllium at 1.8 mg/kg. Composite soil samples collected in 1996 revealed maximum lead concentration of 142 mg/kg and an average lead concentration was 52.6 mg/kg. All metals concentrations were reported to be below soil screening criteria, or PRGs (TtEMI, 2000a).

3.2.2 Group II/III Accelerated Study Sites

As discussed above, the Group II/III sites within IA-E included the ordnance reservoir and DOM 17. The site designated as DOM 17 is one of 36 pump stations that were part of the MINS domestic sewage system. The pump stations were investigated as they were considered the most likely locations of the system to have contamination. Based on sample results, the Navy concluded that DOM 17 does not pose an environmental concern since no contamination or release to the environment was identified (US Navy, 2000). DTSC concurred with this finding in their letter (DTSC, 2000e).

An intrusive investigation of the ordnance reservoir identified no conditions that posed a threat to human health or the environment. No unexploded ordnance or evidence of UXO was found, and no chemical contamination was identified (Ssports, 1997). Based on the site history and historical ordnance disposal practices, and because no UXO or other contamination was found, DTSC concurred in a September 25, 1997 letter (DTSC, 1997).

3.3 UNEXPLODED ORDNANCE (UXO) PROGRAM

Under the UXO Investigation Program for IA-E, the Navy performed an intrusive investigation for the presence of UXO in the upland magazine area, which included Parcels 11-A3, 11-A4, and 12-A2. In IA-E, a total of 23 buildings were investigated for UXO: Buildings A139, A140, A141, A156, A171, A188, A189, A199, A200, A206, A207, A208, A209, A210, A211, A212, A213, A218, A219, A252, A272, A282, and A295. Based on the site history and historical ordnance disposal practices, and because no UXO was found, these buildings were released by the Navy from ordnance concerns. DTSC concluded in a letter dated September 25, 1997 that there was no further concern with UXO and no need for any limitation on the use of this area resulting from unexploded ordnance considerations (DTSC, 1997f).

3.4 POLYCHLORINATED BIPHENYLS (PCBs) PROGRAM

Under the PCB Investigation Program for MINS, the Navy performed basewide PCB confirmation sampling. Within IA-E, transformers were inspected at sites within EBS Parcels 11-A1, 11-A3, 11-A4, and 11-A5 for the presence of PCBs and for visual signs of leakage. All of the transformers were reportedly removed and PCB contamination was abated (TtEMI, 2000b). Eight transformers were removed from IA-E. Three transformers were removed from the golf course area: one from Building 208 and two from Building 658. Five transformers were removed from the upland magazine area: three from Building 211 and two from Building 252. DTSC confirmed that the PCB issue in IA-E had been adequately addressed in their letter to the Navy dated February 28, 2000 (DTSC, 2000b).

3.5 RADIOLOGICAL PROGRAM

Under the Radiological Program for MINS, the Navy conducted extensive surveys to address all possible radiological concerns resulting from historical use of radioactive materials such as radium and the MINS history of building and servicing nuclear submarines (US Navy 1996b, 1996c). With respect to IA-E, CalEPA concluded in letters dated March 18, 1996 and March 29, 1996 that there was no radiological contamination in IA-E (CalEPA, 1996a, 1996b).

3.6 UNDERGROUND STORAGE TANK (UST) PROGRAM

Five underground storage tanks (USTs) sites were investigated in IA-E (see Figure 1-3). Records identified possible USTs at sites 658, 658S, 658S2, BV and Lighthouse. The UST at site 658 was addressed through site investigations and remedial actions that lead the California Regional Water Quality Control Board to provide closure (December 14, 1995). DTSC concurred in a letter dated 3/21/00 (DTSC, 2000f).

Investigations revealed that UST 658S was an old clean water cistern and was abandoned in-place by filling with concrete slurry. However, investigations were not able to locate a UST at site 658S2 and it was subsequently deemed to be nonexistent. The RWQCB concurred with this finding in a letter dated 1/15/99. DTSC agreed with this conclusion in a letter dated 3/21/00 (DTSC, 2000f).

The UST located at site BV was a former 500-gallon heating oil tank. Based on the Navy site closure report, the RWQCB concluded in a letter dated 6/4/98 that no further action was necessary for this UST site. DTSC concurred in a letter dated 6/5/98 (DTSC, 1998).

The Navy investigation for the UST at the Lighthouse site concluded that a UST was not located at this site. Based on the Navy Suspect UST Investigation Part III dated 1/15/99, DTSC concluded that no further action was necessary for this site. The RWQCB documented the same in a letter dated 6/4/98. DTSC agreed in a letter dated 3/21/00 (DTSC, 2000f).

Based on these investigations and related findings, actions to address UST sites are not required for IA-E.

3.7 LEAD IN SOIL

Almost all of the buildings in IA-E are buried magazines with exposed parts of these structures existing as unpainted concrete. The USEPA sampled four structures for lead in soil within IA-E (USEPA, 1999). The results for two of these structures, buildings 658 and 650, (the golf course clubhouse and a nearby storage shed) were below the screening level of 400 ppm for unrestricted

use. The average concentrations of discrete samples were 338 ppm and 59 ppm, respectively, with no individual sample exceeding a 1000 ppm concentration. The other two structures, Freshwater Tanks 188A and 188B were found to significantly exceed screening values.

In 1998, the Navy performed more extensive soil sampling to assess the impact on soil from lead-based paint that was used on the two 2.1-million-gallon above-ground freshwater storage tanks located in the golf course area, Freshwater Tank 188A and Freshwater Tank 188B.

Seventy-nine composite and 50 discrete soil samples were collected around the tanks to characterize the extent of lead in soil. Laboratory results indicated lead concentrations as high as 3,290 mg/kg in soil near Tank 188A and as high as 19,600 in soils near Tank 188B prior to removal of soil. Based on the results of initial soil sampling and analyses, the Navy authorized a maintenance action to characterize the extent of contaminated soil and to remove affected soil to a cleanup goal for lead of 400 mg/kg.

Soil containing lead above the clean up goal was excavated, and approximately 693 tons of soil were excavated and disposed off-site. One hundred and five confirmation (105) soil samples were collected to verify that affected soils were removed.

Lead concentrations detected in the final confirmation samples ranged from 10 mg/kg to 847 mg/kg. Weighted averages were calculated for each tank by assigning a weighting factor to each confirmation composite soil sample. Weighting factors were based on the width of area represented by a sample. Each 3-foot wide segment carried a weighting factor of 1. The weighted and unweighted averages for lead concentrations remaining at tank 188A were 325mg/kg and 272mg/kg respectively. The weighted and unweighted averages for lead concentrations remaining at tank 188B were 353mg/kg and 345mg/kg respectively. Therefore, the Navy concluded that the maintenance action had adequately reduced concentrations of lead in soil for unrestricted use. The results of the remediation of lead in soil were documented by TtEMI in a report dated March 1, 2000 (TtEMI, 2000d). The DTSC, in their letter dated March 2, 2000, confirmed that their previous comments on the presence of lead in soils from lead-based paint had been addressed, and provided "no further comments on this final document" (DTSC,

2000c). Subsequently, seven additional composite samples were analyzed for lead for the purpose of obtaining better lateral extent of residual contamination (WEST, 2000). The additional data provided further support that the average location-wide residual lead contamination is below the screening level concentration of 400 ppm.

The reuse plans for this area include demolition of the remaining Freshwater Tank 188B in the near future. If and when the Freshwater Tank 188B is demolished, limited soil sampling pursuant to a DTSC approved sampling plan will be required to assess the possible changes in levels of lead contamination resulting from demolition.

3.8 OTHER SITES

3.8.1 Golf Course

Records indicate that an arsenical herbicide containing dimethlyarsinic acid was applied at the golf course to control weeds (TtEMI, 2000a). In July 1996, the Navy conducted sampling at the golf course to evaluate concentrations of arsenical pesticides and herbicides and arsenic.

Soil samples were collected in the vicinity of greens, tees, and drainage areas where pesticide and herbicide concentrations were expected to be highest. Six composite samples were collected at three different greens, one tee area, and two drainage areas.

Analytical results indicated the presence of chlordane, dichlorodiphenyltrichloroethane (DDT), dichlorodiphenyltrichloroethene (DDE), dieldrin, endrin, and heptachlor epoxide in the three samples collected from the greens. Concentrations of these pesticides were less than PRGs, except for heptachlor epoxide, which has a PRG of 0.049 mg/kg and was detected at a concentration of 0.1 mg/kg in one of the greens samples (TtEMI, 2000a).

Concentration of arsenic in the soil samples exceeded the PRG of 0.038 mg/kg in all six composite soil samples. Concentrations in three of the six samples were below the

ambient/background concentration established for native soils in the hill area at Mare Island of 16 mg/kg (TtEMI, 2000a). Two other samples were slightly above ambient values (maximum concentration of 18.3 mg/kg). One sample collected near the green at Hole No. 4 contained 122 mg/kg arsenic (TtEMI, 2000a). Nine additional soil samples collected in the vicinity of Hole No. 4 revealed arsenic concentrations ranging from below the laboratory detection limit up to a maximum of 541 mg/kg (TtEMI, 2000a). Several additional phases of soil sampling were performed to delineate the lateral extent of the arsenic concentration in soil. The Navy concluded that concentrations and distribution identified in the limited sampling program were consistent with normal application of pesticides (TtEMI, 2000a).

Based on the results of arsenic concentrations in soil at the golf course, an area of approximately 20 feet by 20 feet was excavated to a depth of 2 feet below ground surface (bgs) in the vicinity of Hole No. 4. Confirmation soil samples were reported to contain less than 20mg/kg arsenic (TtEMI, 2000a, Appendix C). The excavation was backfilled with clean imported fill.

The results of the HHRA show that discrete areas of elevated arsenic concentrations, if present, would not pose an unacceptable risk to human health for the intended future recreational land use, but would present an unacceptable risk in an unrestricted residential scenario (TtEMI, 2000a). The DTSC approved the HHRA as final in their letter dated March 7, 2000 (DTSC, 2000d). As a result of the unacceptable risk presented in the unrestricted residential scenario, remedial action objectives have been developed to address this potential.

4. REMEDIAL ACTION OBJECTIVES

Remedial Action Objectives (RAOs) for Investigation Area E are to protect human health and the environment. The City of Vallejo *Mare Island Final Reuse Plan* designates continued use of the golf course, with the remaining area to be used for recreational purposes (City of Vallejo, 1994). Remedial goals have been developed for IA-E to establish specific concentrations of chemicals in soil that are protective of both human health and the environment under this future use scenario.

Specific remedial goals for the proposed future use of IA-E were developed from: (1) information obtained during remedial investigations at the Site, and (2) risk management decisions for the future use of the Site. Information included soil sampling results and site-specific Human Health Risk Assessments (HHRAs). In addition, a review of pertinent laws, regulations, and other criteria for IA-E was performed to identify other possible State requirements. Although Mare Island Naval Shipyard is not a Federal Superfund Site, the concept of “legally Applicable or Relevant and Appropriate Requirements” (ARARs) and other criteria “to-be-considered” (TBC) was applied to assist in evaluating and selecting remedial actions, in consideration of the fact that MINS is still Federal real property. Regulatory requirements, an assessment of human health risk and the proposed remedial goals for IA-E are presented below.

4.1 REGULATORY REQUIREMENTS

The Superfund Amendments and Reauthorization Act (SARA) requires that remedial actions at Federal Superfund sites achieve a cleanup level that will protect human health and the environment. In addition, cleanups must attain ARARs that are promulgated under Federal or State law, unless a waiver is warranted. Although Mare Island is not a Superfund site, the concept of ARARs has been used to evaluate and select remedial actions for the proposed future recreational use of IA-E.

The following State, Federal, and local agencies have jurisdiction over activities and remedial actions conducted at Mare Island:

- California Environmental Protection Agency (CalEPA), Department of Toxic Substances Control (DTSC) is the lead regulatory agency for investigation and cleanup at IA-E.
- U.S. Environmental Protection Agency (USEPA), Region IX, oversees and regulates protection of human health and the environment, and provides regulatory assistance to other Federal agencies, including the US Navy.
- Bay Area Air Quality Management District (BAAQMD) may regulate the emission of chemicals into the atmosphere during remedial activities.
- California Occupational Safety and Health Administration (Cal/OSHA) has oversight authority for worker protection during remedial activities.
- California Regional Water Quality Control Board – San Francisco Bay Region (RWQCB) has regulatory authority for protection of groundwater and surface water quality.
- City of Vallejo is the designated Local Reuse Authority (LRA) and is responsible for reuse development plans.
- United States Department of the Navy, as the owner and operator, is responsible for implementing CERCLA, and also may have requirements for future land use as a condition of property transfer.

4.2 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs)

As defined in the National Contingency Plan (NCP; USEPA, 1990), an “applicable” requirement is a promulgated Federal or State standard that specifically addresses a hazardous constituent, remedial action, location, or other circumstance.

The NCP defines a “relevant and appropriate” requirement as a promulgated Federal or State requirement that addresses problems or situations sufficiently similar to those encountered, even though the requirement is not legally applicable. A requirement may be relevant but not

appropriate, given site-specific circumstances; such a requirement would not be an ARAR. If only part of a requirement is relevant and appropriate, then only that portion needs to be addressed.

ARARs may be chemical-specific, action-specific, or location-specific. Chemical-specific ARARs are health- or risk-based concentration limits, such as Federal or State drinking water standards for specific chemicals. Action-specific ARARs are technology-based requirements that are triggered by the specific remedial actions. An example of an action-specific ARAR is the National Pollutant Discharge Elimination System (NPDES), which regulates the discharge of pollutants to surface water. Based on site characteristics, location-specific ARARs impose restrictions on certain types of activities. Examples of location-specific ARARs include possible requirements associated with remedial actions in areas designated as wetlands, flood plains, or historical sites. Some ARARs under Federal law are also State requirements pursuant to Chapter 6.8 of the California Health and Safety Code.

The following State regulations are potential ARARs for IA-E:

- California Code of Regulations (CCR), Title 23, Division 3, Chapter 16 Underground Storage Tank (UST) Regulations.
- CCR, Title 8, which requires hazard communication and injury and illness prevention during implementation of remedial action. CCR, Title 8, also requires permits for certain excavation activities, and may include regulation of the operation of construction equipment.
- CCR, Titles 22 and 26, which provide the California criteria for defining hazardous materials and wastes and regulations regarding the storage, treatment, transportation, and disposal of hazardous wastes.
- BAAQMD air quality and air emission regulations.

4.2.1 “To-Be Considered” (TBC) Criteria

Non-promulgated advisories or guidance are referred to as “to-be-considered” criteria (TBCs), which may also be incorporated into the evaluation of potential remedies. Superfund remedies are not required to meet TBCs, but TBCs may be used in the selection of remedies in the absence of ARARs. TBC criteria should be considered when determining the degree of remediation necessary to protect human health and the environment. For example, the USEPA, Region IX, Preliminary Remediation Goals (PRGs) are TBC criteria (USEPA, 1988b). The PRGs establish guidelines for cleanup goals based on the current toxicological and human health exposure assumptions for residential and industrial scenarios.

4.3 DEVELOPMENT OF REMEDIAL GOALS

Pursuant to the NCP, site-specific remedial goals must consider: 1) Federal and State ARARs, if any, which specify concentration standards for Chemicals of Potential Concern (COPCs), independently of site conditions, and 2) risk-based concentrations that are protective of human health and the environment, considering site-specific factors. No Federal or State requirements (i.e., ARARs) have been promulgated that prescribe remediation levels in soil. Therefore, remedial goals were developed based on risk-based calculations that use cancer or non-cancer toxicity values to evaluate site-specific exposure concentrations.

Tetra Tech EM, Inc. (TtEMI) completed a screening-level Human Health Risk Assessment (HHRA) and Ecological Risk Assessment (ERA) to assess potential risks associated with exposure to contaminants detected in surface soils in the upland magazine area and golf course area (TtEMI, 2000a). The HHRA included four components: selection of COPCs, exposure assessment, toxicity assessment, and risk characterization.

4.3.1 Selection of Chemicals of Potential Concerns (COPCs)

Selection of COPCs for the upland magazine area and golf course area was based on analytical data obtained during the July 1996 sampling event in these areas. The COPCs were developed through a

three-step process. First, a preliminary list was developed for each area, which included all chemicals detected in one or more samples. Second, metals for which an ambient level has been derived were deleted from the preliminary list, if their maximum detected concentrations were below the ambient levels established for native soils at Mare Island (PRC, 1995). Third, elements considered essential human nutrients were reviewed for possible elimination as COPCs.

Based on the above process, 14 chemicals were retained as COPCs for the upland magazine area and golf course area. Seven metals were identified as COPCs for the upland magazine area: antimony, chromium, lead, manganese, tin, titanium, and zinc. COPCs for the golf course area were identified as arsenic, 4,4'-DDE, 4,4'-DDE, alpha-chlordane, dieldrin, gamma-chlordane, and heptachlor epoxide. Identification and selection of COPCs for the upland magazine and golf course areas was based on a comprehensive remedial investigation and environmental evaluation process, in conjunction with closure and transfer of Mare Island to the City of Vallejo.

This multi-step process included base-wide soil and groundwater sampling and analyses. The US Navy also performed surveys for hazardous material facilities and wastes, including unexploded ordnance (UXO), USTs, radioactive materials, and PCB transformers. Potential source areas considered to pose a potential health risk were identified through the above surveys. Previously identified sources in IA-E have been abated, including lead-affected soils in the upland magazine area and arsenic-affected soils in the golf course area.

4.4 EXPOSURE ASSESSMENT

In order for an exposure scenario to be complete, there must be a source of chemicals, a mechanism for exposure to the chemicals, and receptors (human) present at the exposure point. The potential routes of exposure evaluated within the PRG framework are a commercial/industrial scenario and a residential scenario. In general, the residential use scenario represents the greatest potential exposure to COPCs; therefore, residential scenarios would substantially over-estimate potential risks associated with future recreational use of IA-E.

Currently, the upland magazine area is primarily open space and receptors are restricted to Mare Island personnel involved in occasional surveillance or site investigations. The most likely

receptors under the proposed future use would be recreational visitors and employees. In both cases, the potential exposure pathways would involve contact with surface soils, including incidental ingestion, dermal contact, and inhalation of particulates.

Maximum detected COPC concentrations generally were used as the assumed exposure-point concentrations. Various exposure-point concentrations were evaluated for arsenic in the golf course area to reflect different assumptions. As previously noted, arsenic was detected at a relatively high concentration on the golf course, near the hole 4 green. The affected soil was excavated and removed from IA-E. Although the affected soil was removed, it is possible that, due to prior pesticide use, soil with similarly elevated concentrations of arsenic could be present in other parts of the golf course. Considering the range of arsenic concentrations potentially present, the following exposure-point concentrations were considered for the golf course area:

- Case 1: maximum arsenic concentration in pre-excavation data set (122 mg/kg)
- Case 2: average arsenic concentration for pre-excavation data set (32.5 mg/kg)
- Case 3: maximum arsenic concentration in post-excavation data set (18.3 mg/kg)

4.5 TOXICITY ASSESSMENT

The HHRA used PRGs to assess potential cancer risks and Hazard Indices (HIs) to characterize non-carcinogenic effects, in accordance with USEPA and DTSC guidance (USEPA, 1988b; DTSC, 1994). The PRGs are based on commercial/industrial and residential scenarios. Since IA-E will be used for recreational purposes, these scenarios would significantly overestimate potential risks associated with IA-E under the anticipated future redevelopment plans.

4.6 RISK CHARACTERIZATION

4.6.1 Non-Carcinogenic Hazard

For non-carcinogenic effects, the NCP states that an acceptable exposure level is defined as a HI of less than 1. The total HI was derived by obtaining Hazard Quotients (HQs) for each COPC (except lead), based on their respective PRGs and exposure point concentrations. The HQs were summed to derive the HI. An alternate process was used for lead, since the PRG for lead does not represent a soil concentration corresponding to a HQ of 1.

Upland magazine area: A total HI of 0.03 was derived for the commercial/industrial worker. A total HI of 0.53 was derived for a hypothetical future resident. These values indicate a low risk of non-carcinogenic health effects under the exposure conditions evaluated. The potential health risks for recreational users would be lower than those calculated under the commercial/industrial worker exposure scenario.

The potential effects of lead were evaluated using the mathematical model, Leadsread, developed by DTSC (DTSC, 1992). This model estimates blood-lead concentrations based on total lead uptake from exposures via diet, drinking water, air, and soil. The maximum lead soil concentration of 142 mg/kg was used for this analysis. Children are the most sensitive receptors with regard to lead exposure. The Centers for Disease Control (CDC) has recommended that children's blood-lead levels should be below 10 micrograms per deciliter ($\mu\text{g/dL}$) (CDC, 1991). According to the HHRA, the child blood-lead level would be less than 10 $\mu\text{g/dL}$ for 99 percent of the population, assuming residential exposure. Under the proposed future recreational use scenario, the potential exposures to lead would be considerably lower than indicated above for residential exposure.

Golf course area: As discussed in Section 4.3, three exposure point concentrations were considered for this part of IA-E, reflecting different assumptions about the arsenic concentrations present in the golf course area. In all cases, the total HI estimated for workers was less than 1.0, which indicates acceptable exposure levels. The potential health effects on recreational users of

the golf course would be less than those estimated for workers. For the hypothetical residential exposure scenario, the total HI was greater than 1 for all assumed arsenic concentrations. Other COPCs did not contribute substantially to the total HI. However, as previously noted, the City of Vallejo's *Mare Island Final Reuse Plan* does not call for residential development of this portion of Mare Island (City of Vallejo, 1994).

4.6.2 Carcinogenic Risk

Carcinogenic risk is estimated as the probability that an individual will develop cancer over their lifetime due to exposure to the COPCs. The NCP identifies the risk range of 10^{-4} to 10^{-6} (or 1 in 10,000 to 1 in 1,000,000) as generally acceptable for Superfund sites. This range is consistent with USEPA PRGs (USEPA, 1998b).

As part of the HHRA, the total carcinogenic risk for all COPCs was estimated based on the PRGs and exposure point concentrations.

Upland magazine area: Excess cancer risks were not estimated for this portion of IA-E, since no carcinogenic COPCs were identified in the upland magazine area.

Golf course area: Arsenic was the primary contributor to total cancer risk estimates for this portion of Mare Island. As previously noted, three exposure point concentrations for arsenic were considered. For the industrial/commercial exposure scenario, the excess cancer risk ranged from 9×10^{-6} to 5×10^{-5} for post-excavation and pre-excavation arsenic concentrations, respectively. For the residential exposure scenarios, the excess cancer risk ranged from 5×10^{-5} to 3×10^{-4} for post-excavation and pre-excavation arsenic concentrations, respectively. These probabilities fall within, or slightly exceed, the USEPA risk management range. Although the potential health risks to recreational users were not estimated, the potential excess cancer risks would be lower than those estimated for industrial/commercial workers in this area.

4.7 ECOLOGICAL RISK ASSESSMENT (ERA)

TtEMI completed a focused ERA for Investigation Area E (TtEMI, 2000a). The ERA did not identify any significant potential ecological risks based on screening evaluations and field observations.

The golf course is a highly managed area, with cultivated turf and other landscaping. Considering that pesticides are routinely applied in this area to control weeds and insects, the ERA did not assess ecological risks to plants and invertebrates in this area. However, TtEMI did perform a food-chain analysis to assess potential risks to vertebrates in both the golf course and upland magazine areas. Based on this analysis, TtEMI concluded that chemicals ingested by critical receptors (western harvest mouse, California vole, western meadowlark, red-tailed hawk, and gray fox) do not present a significant risk to these receptors, with the possible exception of lead. The analysis for lead indicated a potential ecological risk. However, similar environmental effects were predicted using ambient lead levels for Mare Island. Therefore, the ERA stated that the US Navy does not consider lead concentrations to present a significant risk to ecological receptors in IA-E.

4.8 SUMMARY OF REMEDIAL ACTION OBJECTIVES

As stated above, the RAOs for IA-E are to protect human health and the environment. Based on a review of potential ARARs and the focused HHRA and ERA, arsenic was identified as the most significant COPC. Other chemicals were not found to contribute significantly to health or ecological risks. The HHRA used conservative assumptions, including future exposure to soil containing arsenic at the same concentration as soil that had been removed previously from the golf course area. Therefore, measures to control exposure to arsenic in soil are required for the long-term protection of human health. The following section identifies potential remedial technologies that could be used to achieve this remedial action objective (RAO).

5. IDENTIFICATION AND SCREENING OF TECHNOLOGIES

This section presents a summary and screening evaluation of remedial technologies that might be applicable to attain the Remedial Action Objectives (RAOs) at the Site. Remedial technologies considered include the “no action” alternative, as identified by DTSC and USEPA to provide a basis of comparison (USEPA, 1988a). The remedial technologies initially were screened for appropriateness for use at the Site, based on their ability to achieve the RAO. Evaluations of remedial alternatives presented in this RAP have been prepared consistent with the procedures outlined in the NCP.

5.1 SCREENING CRITERIA

The screening criteria used are based on the guidance provided by USEPA (USEPA, 1988a). These screening criteria include, in order of importance, technical effectiveness, implementability, and cost. A description of each of these criteria is presented below.

5.1.1 Technical Effectiveness

Technical effectiveness refers to the ability of a technology to address: (1) the estimated areas or volumes of media requiring remediation and to meet the site RAOs, (2) the potential impacts to human health and the environment during implementation and any construction phase, and (4) the long-term reliability and proven history of the technology with respect to the types of chemicals and conditions at the Site.

5.1.2 Implementability

Implementability refers to both the technical and institutional feasibility of implementing a particular remedial technology, including: (1) the likelihood of obtaining permits and approvals from regulatory agencies, (2) considerations of storage and disposal facilities, and (3) availability of the equipment, materials, and skilled workers necessary to implement the particular technology.

5.1.3 Cost

Cost refers to the relative capital and Operations and Maintenance (O&M) costs associated with a particular technology. Costs are estimated using best engineering judgment and are presented as low, medium, or high. Cost is used to eliminate options that are substantially more expensive than other process options providing the same level of protection.

5.2 POTENTIAL APPLICABLE REMEDIAL TECHNOLOGIES

The potential applicable remedial technologies to address COPCs in IA-E soils were:

1. "No Action."
2. Institutional Controls.
3. Soil Treatment.
4. Capping with Institutional Controls.
5. Excavation.

These technologies appear applicable at the Site, based on the results of the remedial investigations and remedial goals evaluation presented in Section 4.0. A brief description of each technology is presented below with a discussion of the screening. The rationale for selection or rejection of each remedial technology also is presented below and summarized on Table 5-1. The remedial technologies that were retained have been developed further and analyzed in Section 6.0.

5.2.1 "No Action"

The "no action" alternative was included in the evaluation as a basis for comparison of other alternatives. Evaluation of the "no-action" alternative is consistent with the requirements of the NCP. The "no action" alternative serves as a reference for evaluating and comparing the

technical effectiveness, implementability, and cost of other alternatives. Based on results of the risk assessment evaluations, this alternative would not be protective of human health under the future site use scenario and would not satisfy regulatory requirements for the management of potentially hazardous substances. The “no action” alternative is, however, retained because it is required to be considered.

5.2.2 Institutional Controls

Implementation of institutional controls might reduce potential exposure, maintain compatible site use, and, if implemented, aid in maintaining the integrity of other remedial activities. Several institutional controls might be available, including restrictive covenants, deed restrictions, notification, local restrictive ordinances, and requirements in those instruments for such engineering controls as fencing, signage, caps, and other barriers to exposure. One or more of these institutional controls could be applied to restrict future uses of the property to those compatible with the presence of arsenic at concentrations present at the site. The deed restrictions could preclude residential use, could prohibit installation of groundwater wells for potable or non-potable use, could prohibit excavation of soil or require testing of soil and proper management, or generally could restrict disturbances of the site soil or other uses not in keeping with the remedy.

For the purposes of this RAP, we have assumed that the deed restrictions might require the property owner(s) to comply with notification requirements, testing requirements, and waste disposal requirements if subsurface operations (i.e., trenching for utilities, landscaping) were conducted at the Site. Based on the future site use scenario, institutional controls are considered a feasible alternative and are therefore retained as both an exclusive remedial option, or to be used in conjunction with other remedial technologies.

5.2.3 Soil Treatment

Soil treatment technologies involve the reduction of the mobility or mass of COPCs present in the subsurface without removal of the soil from the site. *In situ* soil treatment technologies

involve implementing that reduction without excavation. Soil treatment technologies considered for heavy metals included *in situ* solidification/stabilization, *in situ* vitrification (USEPA, 1993), and soil washing.

***In situ* Solidification/Stabilization.** *In situ* solidification/stabilization involves the use of large soil augers for the mixing and introduction of soil fixation agents, such as pozzolanic materials. Although the technology has been successfully implemented at various sites, it would not appear viable for this project due to the relatively high cost, approximately \$200 per ton (USEPA, 1993), and due to the presence of the golf greens that would limit the potential for soil mixing. Use of this technology would also require monitoring and deed restrictions because hazardous substances would likely remain on site.

***In situ* Vitrification.** *In situ* vitrification uses electricity to melt contaminated soil and produce a glass-like material with relatively low leaching characteristics. The cost of *in situ* vitrification has been estimated at over \$790 per ton (USEPA, 1993). *In situ* vitrification is a relatively complex, high-energy technology that would not be appropriate for this Site.

Soil Washing. Soil washing uses water, surfactants, and pH control to remove metals adsorbed to soils. Soil washing may be implemented either as an *ex situ* (above ground) technology or as an *in situ* technology. In an *ex situ* implementation, either tanks or a constructed pit may be used for washing the soils. Chemicals are added to the water to maintain the required pH for dissolving a particular metal. The water is then drained to another tank for additional pH control to precipitate the metals and the sludge hauled to a landfill for disposal as a hazardous waste. The treated soils may be backfilled on the site or used as daily cover at a landfill. In an *in situ* implementation, water with surfactants or solvents is injected into the soil to dissolve the particular metal. The water is then re-extracted and the metals are removed above ground. The *in situ* soil washing technologies are considered pilot-scale at the present time and are therefore excluded from consideration for this site. The *ex situ* soil washing treatment technologies do not appear viable for consideration for this project due to high cost and due to the future use planned for the site. Therefore, soil treatment was not retained for further consideration.

5.2.4 Capping Soil with Institutional Controls

Capping involves placing a barrier over any affected area that isolates the hazardous substance or contaminated soils and prevents or minimizes exposure. Caps are typically constructed of low-permeability materials such as clay, concrete or asphalt. Caps have proven effective in preventing contact with contaminated soil and reducing the vertical migration of contaminants through the soil. Installation of a cap at the Site might be effective in preventing contact with heavy metal.

The cost of capping would be low, relative to the other remedial technologies considered for this Site. This alternative would not be expected to result in potential adverse impacts to human health during implementation, and equipment, materials, and skilled workers are readily available. It is anticipated that this technology would be effective in the short-term. Long-term integrity would depend on the quality of the construction and the measures undertaken to maintain it. The cap would have to be designed and constructed to ensure that building foundations and other site uses did not compromise the integrity of the cap. Use of the cap might require that it be considered in conjunction with institutional controls. Therefore, a combined alternative of capping with institutional controls was retained for further evaluation.

5.2.5 Excavation

Excavation is a practical source control measure that would be applicable to the conditions at the Site. The cost of this technology depends on total depth and quantity of material excavated, the proximity of structures, the potential need for treatment prior to disposal or reuse, and water removal and treatment requirements.

Excavation involves removal of the hazardous substance or contaminated material from affected areas using conventional construction equipment such as backhoes and bulldozers. Excavated materials would be used on-site or transported and disposed off-site. Soils excavated from the Site would require one of the following measures:

Disposal. Off-site disposal would be an effective means of permanently removing impacted soil from the Site. An off-property site could be used to dispose of treated or untreated soils. The technical requirements of the off-site property would depend on the types and concentrations of COPCs in the soils. Disposal sites could include appropriate Class 1 or Class 2 landfills.

Reuse. While soil concentrations in IA-E do exceed health-based screening level concentrations, the majority of the soils contain concentrations less than the Total Threshold Limit Concentrations (TTLCs). Analytical results for some soils indicated that concentrations exceeded the TTLCs; however, this does not preclude the recycling of these soils. Treated materials might be used on Caltrans roadway construction projects requiring fill or base materials, or the material could be used as daily cover at an appropriate class of landfill.

Excavation followed by off-site disposal of excavated materials is considered a feasible alternative for the Site based on the following criteria: (1) the technology would be effective in the short- and long-term, (2) engineering controls would be implemented to minimize potential adverse impacts to human health during implementation, (3) equipment, materials and skilled workers are readily available, (4) storage and disposal facilities are available, (5) excavation would be expected to be implementable from an administrative perspective, and (6) the total capital and O&M costs would be moderate.

5.3 SELECTION OF REMEDIAL ACTION ALTERNATIVES

The RAOs, as defined in Section 4.0, are designed to protect public health and the environment by preventing ingestion, dermal contact, and inhalation of COPCs that result in an unacceptable risk in a residential scenario. Remedial goals are defined here as numerical concentration goals for completed pathways of exposure to COPCs at the Site needed to meet these RAOs. Two exposure scenarios are considered here: residential exposure and industrial or recreational exposure. If residential exposure is to be allowed under this remedy, then the remedial goal would be either background, or some concentration between the residential PRG (.38ppm for arsenic) and that concentration which would result in a risk of greater than 10^{-4} . For industrial or recreational exposure, the remedial goals would be a concentration that results in an industrial or

recreational risk in the 10^{-4} to 10^{-6} range, and would need to be coupled with measures to prevent residential exposure. DTSC has approved Preliminary Remedial Goals (PRGs) for the only COPC that is to be carried through for remedy. The remedial cleanup goal for arsenic in site soil is 18 mg/kg as the estimated 95 percent upper confidence interval of the arithmetic mean.

Based on the screening level evaluation, reasonable combinations of remedial technologies have been identified to meet the RAOs. The retained remedial technologies were combined to form the following remedial action alternatives, which are analyzed further in Section 6.0:

1. "No Action"
2. Implementation of Institutional Controls
3. Capping with Institutional Controls
4. Excavation with Off-Site Disposal.

The remedial action alternatives were selected by comparing the technical effectiveness, implementability, and cost of each technology. The rationale for selecting and combining of remedial technologies to develop the selected remedial action alternatives for further evaluation is summarized on Table 5-2.

6. EVALUATION OF REMEDIAL ACTION ALTERNATIVES

The remedial action alternatives discussed in Section 5.0 that have been retained for detailed analysis are further evaluated in this section using criteria that are more specific. The alternatives were evaluated using the two threshold and five modifying criteria established by USEPA for evaluating remediation options:

Threshold Criteria:

1. Overall protection of human health and the environment - Describes how the alternative as a whole would achieve and maintain protection of human health and the environment.
2. Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) - Describes how the alternative complies with ARARs, as identified in Section 4.0 of this RAP.

Modifying Criteria

1. Long-term effectiveness and permanence - Evaluates the long-term effectiveness of alternatives in maintaining protection of human health and the environment after Remedial Action Objectives (RAOs) have been met.
2. Reduction of toxicity, mobility, or volume through treatment - Evaluates the anticipated performance of the specific chemical remedial and treatment technologies.
3. Short-term effectiveness - Evaluates the effectiveness of alternatives in protecting human health and the environment during the construction and implementation of a remedy.
4. Implementability - Evaluates the technical and administrative feasibility of the alternatives.
5. Cost - Evaluates the capital and Operation and Maintenance (O&M) costs of each alternative.

Two additional criteria requiring regulatory and community input are required by the NCP:

1. State acceptance - Assesses the technical and administrative concerns regulatory agencies have regarding the remedial alternatives.
2. Community acceptance - Assesses the issues and concerns the public may have for each remedial alternative.

This RAP is submitted for public review and comment prior to final selection of the remedial action alternative.

The following contains an evaluation of the identified remedial alternatives using the criteria described above. Cost estimates for the alternatives are summarized in Tables 6-1 through 6-3, and a summary table of this evaluation is presented in Table 6-4. The cost estimates prepared for this analysis are for screening purposes only. For the purposes of the cost estimates, preliminary design parameters were used. Final cost estimates should be made based on the final remedial plan and refinement of these parameters.

The capital cost estimates developed for this evaluation include equipment, construction, engineering, permitting, and construction management. A contingency factor of 20 percent has been included in the cost estimates to cover some or all of the unknown costs.

The cost estimates have been developed from vendor and contractor quotes, historical cost information, cost estimating manuals, and best engineering judgment. Typically, preliminary cost estimates of this type are considered accurate to a range of minus 30 percent to plus 50 percent (AACE, 1993). The reasons for this large range are the variability of construction materials, variability in construction costs over time, the complexity of developing site-specific cost factors, and sensitivity of construction costs to economic factors such as interest rates and materials costs.

Although some of the costs are not literally capital costs (i.e., construction management, engineering, and permitting), these costs have been included to represent clearly one-time initial costs versus long-term annual O&M costs.

6.1 ALTERNATIVE 1 - "NO ACTION"

The "no action" alternative would not reduce the concentrations of arsenic in site soil. Therefore, according to the risk evaluation performed at the Site, this alternative would not be protective of human health and the environment. This alternative does not comply with ARARs.

6.1.1 Technical Effectiveness

The "no action" alternative would not provide long-term or short-term effectiveness, and the toxicity, mobility, and the volume of arsenic in site soil could be expected to remain essentially the same with no action.

6.1.2 Implementability

This alternative would be readily implementable.

6.1.3 Cost

No cost is associated with this option.

6.2 ALTERNATIVE 2 – INSTITUTIONAL CONTROLS

Institutional controls would involve the recording of restrictions on the use of the property. Specifically, this would involve execution of a restrictive covenant between DTSC and the City of Vallejo. This covenant would specify the restrictions contemplated in this RAP and would run with the land. The covenant would be modifiable only with the approval of DTSC. Since no mechanism will exist to record the covenant until the City owns the property and since the Navy cannot transfer the property until the remedy is in place, DTSC would enter into a Memorandum

of Agreement (MOA) with the City of Vallejo. The two parties would agree to execute the covenant upon transfer of the property. The MOA, therefore, would serve to implement the remedy for the purposes of restricting use and advancing transfer. This alternative is anticipated to be effective if the restrictions can be maintained. The restrictions would require the owner to comply with notification requirements, land use restrictions, and waste disposal requirements if subsurface operations were proposed and conducted at the Site.

6.2.1 Technical Effectiveness

Protection: Given proposed future use by golf course workers and recreational users, the use restriction at the Site would be protective of human health and the environment, as soil ingestion, dermal contact, and fugitive dust inhalation in a recreational use scenario would not result in significant risk. Deed restrictions would also reduce the chemical mobility by reducing the potential for unrestricted offsite transport of arsenic-affected soil.

ARARs: Institutional controls appear to be consistent with site ARARs and other requirements.

Permanence: Deed restrictions would require long-term land use monitoring and testing of soils to be disposed off-site. Due to the persistence of arsenic in the environment, deed restrictions would have to be maintained in perpetuity. As the use of the property is not anticipated to change, enforcement of deed restrictions does not appear to be a problem. It is expected that long-term permanent deed restrictions would be effective.

Toxicity Reduction: Overall toxicity or volume would not be reduced. On-site containment would provide a reduction in mobility of the COPCs because migration of dust would be eliminated and downward migration of metals in soil would be reduced.

Short-Term Effectiveness: Potential exposure of workers would not be significant if the affected soil were disturbed on an occasional basis. In addition, the single ownership of the land would increase the potential to detect and restrict subsurface operations (i.e., digging) and to enforce the terms of the deed restrictions. Therefore, this remedial alternative would be effective in the short term.

6.2.2 Implementability

Deed restrictions are a widely used and proven technology. The techniques used to develop and regulated deed restrictions are well established, and the equipment and labor would be ready available.

6.2.3 Cost

The estimated costs would include both capital costs and O&M costs for a 30-year time frame. Thirty years was selected based on the USEPA guidance; however, it is anticipated that monitoring and maintenance would be a permanent part of this alternative. The total net present value for capital and 30 years of O&M has been estimated at approximately \$18,000 (Table 6-1).

6.3 ALTERNATIVE 3 – CAPPING WITH INSTITUTIONAL CONTROLS

Capping would involve placing a cover (barrier) over the affected soil. An area would be designated for the capping. The cap could be constructed of compacted clay, concrete and/or asphalt over properly compacted sub-grade. The cap would be designed to isolate the affected soil and minimize or prevent exposure to chemicals in soil. To facilitate the reconstruction of the greens, it is anticipated that the cap would be constructed approximately 18 inches thick and that 3 feet of clean backfill would be required to produce a finished grade and provide isolation from the cap. The excess soils left from excavating the capping area would be backfilled in areas from where the metal-affected soils were excavated.

This alternative would be effective only if the cap could be maintained and intrusions (for example, utility trenches, landscaping) could be prevented. To maintain the cap and regulate intrusive activities following installation of the cap, institutional control in the form of deed restrictions would be implemented in combination with cap installation. The deed restrictions would be recorded. The restrictions would require the owner to comply with notification requirements, land use restrictions, and waste disposal requirements if subsurface operations were to be proposed and conducted at the Site.

6.3.1 Technical Effectiveness

Protection: Capping of contaminants on-site would be protective of human health and the environment because it eliminates potential exposure pathways for soil ingestion, dermal contact, and fugitive dust inhalation. Capping would also reduce the chemical mobility by reducing the amount of moisture infiltration from the ground surface.

ARARs: Capping with institutional controls might comply with site ARARs.

Permanence: Capping would require long-term O&M. Due to the persistence of metals in the environment, the cap would have to be operated and maintained in perpetuity. Therefore, the long-term permanence of the capping cannot be assured. Another critical element of long-term effectiveness of this option would be the institutional controls (i.e., deed restrictions).

Toxicity Reduction: Overall toxicity or volume would not be reduced. On-site containment would provide a reduction in mobility of the COPCs because migration of dusts would be eliminated and downward migration of metals in soil would be reduced.

Short-Term Effectiveness: Potential exposure of workers to affected soil during cap construction would be mitigated by dust control measures during implementation. This remedial alternative would be effective in the short term.

6.3.2 Implementability

Capping is a widely used and proven technology. The techniques used to install a cap are well established and the equipment, materials, and labor would be ready available. However, the installation of a cap in a recreational land use scenario is problematic, because landscape areas might be located over portions of the cap. Construction of the cap, therefore, would require special planning and design. Removal of up to 6 feet of the surface soils could be required to allow for the installation of the cap and backfill with “clean” materials in areas under recreational use areas. Further, the stability of the cap could be compromised by the remaining underlying

fill materials. Excavation and re-compaction of these materials might be required to implement a cap at this Site.

6.3.3 Cost

The estimated costs would include both capital costs and O&M costs for a 30-year time frame. Thirty years was selected based on the USEPA guidance; however, it is anticipated that monitoring and maintenance would be a permanent part of this alternative. The total net present value for capital and 30 years of O&M is estimated at approximately \$249,000 (Table 6-2).

6.4 ALTERNATIVE 4 – EXCAVATION AND OFF-SITE DISPOSAL

Excavation and off-site disposal would include removal of soils with concentrations of COPCs exceeding cleanup levels. Excavation of the metal-affected soils would be advanced to approximately 1 foot below ground surface. This is the reported depth of the metal-affected soils. It is not anticipated that groundwater would be encountered at this depth.

After excavation, confirmation samples would be collected from the excavation sidewalls to ensure that soils with concentrations exceeding cleanup levels have been removed. The stockpiled soil would be sampled to determine disposal requirements. Soil containing metals or other constituents in excess of TTLCs would be hauled by a properly licensed transporter to an appropriate Class 1 disposal facility. Soils with concentrations of COPCs in excess of the remedial goals, but not in excess of the TTLCs, could be deposited at a suitable location off-site. Soils with concentrations of COPCs less than the remedial goals (clean fill) would be used for backfill on-site to the extent possible in surface zones where uncontrolled access to soils was available.

The soils with concentrations above the remedial goals would be disposed at an appropriate landfill. Based on the previous sampling, it has been estimated that the 2,500 yards, or approximately 4,000 tons of the soils would require off-site disposal.

6.4.1 Technical Effectiveness

Protection: Excavation would be protective of human health and the environment because soils with metals concentrations exceeding cleanup levels would be removed from the Site. After excavation and transport from the Site, the excavated soil would be placed at a facility designed to manage such waste.

ARARs: This alternative would comply with all ARARs that apply to management and disposal of soils.

Permanence: Excavation would be expected to provide long-term effectiveness and permanence. All soil containing concentrations exceeding cleanup levels would be removed from the Site.

Toxicity Reduction: Excavation would provide a reduction in mobility of the chemicals of concern, because affected soil would be removed from the Site and placed at a facility designed to contain such waste. Overall potential for toxicity, however, might not be reduced through the consolidation of wastes.

Short-term effectiveness: Potential exposure of workers to affected soil during excavation and transport loading would be mitigated by dust control measures and engineering controls during implementation. Transportation of impacted soils to an off-site location would be performed to minimize the potential for accidents or spills.

6.4.2 Implementability

Excavation is a widely used and proven remedial measure. The techniques used to complete the excavation are well established and the equipment, materials and labor would be readily available. This alternative is a well-developed and reliable remedial action alternative.

6.4.3 Cost

The estimated costs would include excavation, transportation, and disposal of affected soil. No additional future or annual O&M costs would be expected. The cost for this alternative has been estimated at approximately \$936,000 (Table 6-3), based on approximately 4,000 tons of material being excavated and disposed at a landfill.

6.5 COMPARATIVE ANALYSIS

This section provides a comparative analysis of the remedial alternatives using the standard criteria evaluated for each alternative.

6.5.1 Technical Effectiveness

Alternative 1 (“no action”) does not meet ARARs. Alternative 2, 3 and 4 would be protective of human health and the environment in the long term. Alternatives 2, 3 and 4 would provide permanence and long-term effectiveness, while Alternative 1 would not. Alternatives 3, and 4 would reduce chemical mobility. The short-term effectiveness appears to be similar for Alternatives 2, 3, and 4, while Alternative 1 would not provide short-term effectiveness.

6.5.2 Implementability

Alternative 1, although implementable, would not be acceptable to the regulatory community or to the public. Alternative 3 would require the maintenance of a cap in a recreational setting and might also require problematic permitting and closure requirement. Alternatives 2 and 4 appear to be implementable.

6.5.3 Cost

Alternative 1 would be ineffective; therefore, its cost-effectiveness would be poor. Alternative 2 would have very low costs, making it cost-effective. Alternatives 3 and 4 both are effective, but both would have a higher cost, so would be less cost-effective than Alternative 2.

Therefore, based on technical effectiveness, implementability and cost, Alternative 2 appears the most appropriate option. A summary of the comparative analysis is presented on Table 6-4.

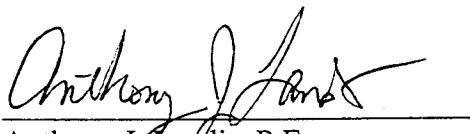
7. RECOMMENDED REMEDIAL ACTION ALTERNATIVE

Implementation of Institutional Controls, specifically through execution of a MOA in which DTSC and the City agree to execute a restrictive covenant, is the recommended remedial action for the original 9-hole golf course area within Investigation Area E Site at Mare Island. (A corresponding legal description and accompanying plat map are included as Appendix B). This alternative was selected based on evaluation of the ability of the each alternative to meet the Remedial Action Objectives (RAOs) for planned future land use at the Site.

Comparative analysis of the standard criteria evaluated for each removal alternative indicates that, with the exception of short-term effectiveness, Alternative 2 is essentially equal to or superior to the other alternatives. Alternative 2 would be technically effective. It would be protective of human health and the environment and comply with ARARs; it would provide permanence, long- and short-term effectiveness; and reduce chemical mobility. Alternative 2 would be implementable. The cost of the recommended remedial action alternative has been estimated at approximately \$18,000. Alternative 2 would, therefore, also be cost-effective.

The selected remedy for the original 9-hole golf course area within Investigation Area E is protective of human health and the environment. This remedy complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and it is cost effective. This remedy makes use of permanent solutions to the maximum extent practicable.

Because the selected remedy may allow hazardous substances to remain on site and above levels that allow for unrestricted use, a statutory review will be conducted within 5 years after the remedial action is implemented to ensure that the selected remedy for the original 9-hole golf course area within Investigation Area E continues to provide adequate protection of human health and the environment.



Anthony J. Landis, P.E.
Chief of Operations, Office of Military Facilities
California Environmental Protection Agency
Department of Toxic Substances Control

6-29-00

Date

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REMEDIAL ACTION PLAN
INVESTIGATION AREA E, MARE ISLAND NAVAL SHIPYARD

TABLES

TABLE 3-1
SUMMARY OF SITE INVESTIGATIONS
Investigation Area E
Mare Island Naval Shipyard
Vallejo, California

Program		Subgrouping	Sites	COPC Metals, Pesticides, VOCs, VOCs, PCBs	Action
IR	Installation Restoration	Group I	IR 22 - Ammunition Bunkers	Pesticides, VOCs	Soil excavated
		Group II/III	DOM 17	VOCs, PCBs	Nothing found/none required
UXO	Unexploded Ordnance		Upland Magazine	UXO	Nothing found/none required
PCB	Polychlorinated Biphenyls		11-A1	PCBs	None required
			11-A3	PCBs	remediated/soil excavated
			11-A4	PCBs	None required
			11-A5	PCBs	None required
RAD	Radiological	G-RAM & N-RAM	various	Radionuclides	None required
			658		Closed/none required
			658-S		Closed/none required
USTs	Underground Storage Tanks		658-S2	Petroleum	Not located/none required
			BV	Hydrocarbons	Closed/none required
			Lighthouse		Not located/none required
PB	Lead in Soil from Paint		Tank 188A	Lead	Soil excavated
			Tank 188B		
OTHER			Golf Course	Arsenic	Soil excavated

TABLE 5-1
INITIAL SCREENING OF POTENTIAL REMEDIAL TECHNOLOGIES
Investigation Area E
Mare Island Naval Shipyard

REMEDIAL TECHNOLOGY	PROCESS OPTION/ COMPONENT	DESCRIPTION	Vallejo, California	
			SCREENING COMMENTS	RETAINED
No Action	None	No action taken at the site	Required by guidance to provide baseline for comparison	Yes
Institutional Controls	Deed Restrictions	Covenants to be placed on Property to restrict activities which could lead to exposure to potential receptors	Not effective in long term for residential, but may effective in conjunction with capping	Yes
Soil Treatment	Solidification/Stabilization Vitrification Soil Washing	Soil treatment options to reduce mobility or mass of contaminants	Not effective at this site due to cost and implementability	Yes
Capping	Multi-layer Cap	Installation of multi-layer cap over areas of contamination	Proven technology. Only applicable on-property.	Yes
Excavation	Backhoes, Trackhoes, Dozers, Loaders	Removal of contaminated soil and backfilling with clean soil	Proven technology. Assembled with treatment/disposal process options.	Yes
Disposal	Off-site disposal	Transportation to landfill	Proven technology. Requires disposal in landfill, does not reduce toxicity.	Yes

TABLE 5-2
SELECTION OF REMOVAL ALTERNATIVES FOR DETAILED ANALYSIS
Investigation Area E
Mare Island Naval Shipyard

REMOVAL ALTERNATIVE	EFFECTIVENESS	IMPLEMENTABILITY	RELATIVE COST	RETAIN
1 No Action	Not Effective. Location on and off-site would retain COCs at concentrations greater than ARCs	Implementable	Low	Yes. Required as reference
2 Institutional Controls - Deed Restrictions	Effective. Property is reasonably anticipated to be remain recreational use under single ownership. Protection dependent on enforcement of deed restriction.	Implementable in long term	Medium	Yes
3 On-Site Cap with Deed Restrictions	Effective. Property is reasonably anticipated to remain recreational use. Protection dependent on maintenance of cap and enforcement of deed restriction.	Difficult to maintain cap in long term	High	Yes
4 Excavation with Off-site Disposal	Effective. Removes affected soil, uses existing control measures to protect human health and environment	Implementable	High	Yes

TABLE 6-1
COST ESTIMATE
ALTERNATIVE 2 - INSTITUTIONAL CONTROLS
Investigation Area E
~~Mare Island Naval Shipyard~~
Vallejo, California

ITEM	DESCRIPTION	QUANTITY	UNITS	UNIT COST	TOTAL
1.0	CAPITAL COST				
1.1	Metals Affected Soil Area				
	Adopt deed restriction language	1	ls	\$10,000.00	\$10,000
	<i>Metals Affected Soils Area Subtotal</i>				\$10,000
	TOTAL ESTIMATED CAPITAL COST				\$10,000
2.0	INDIRECT CAPITAL COST				
	Engineering	10%	of	\$10,000	\$1,000
	Permitting	5%	of	\$10,000	\$500
	Contingency	20%	of	\$10,000	\$2,000
	<i>Indirect Capital Cost Subtotal</i>				\$3,500
	TOTAL INDIRECT CAPITAL COST				\$4,000
3.0	ANNUAL OPERATION AND MAINTENANCE				
	Maintenance of deed restriction	1	LS	\$250	\$250
	<i>Annual Operation and Maintenance Subtotal</i>				\$250
	TOTAL ESTIMATED O&M COST				\$300
	PRESENT WORTH OF O&M COST				\$4,000
	NET PRESENT WORTH OF ALTERNATIVE (rounded)				\$18,000

Notes: 1. Present worth calculated at an 5% (interest minus inflation) rate for a period of 30 years.
2. Deed restrictions on future use of soil on property.

TABLE 6-2
COST ESTIMATE
ALTERNATIVE 3 - CAPPING WITH INSTITUTIONAL CONTROLS

Investigation Area E
Mare Island Naval Shipyard
Vallejo, California

ITEM	DESCRIPTION	QUANTITY	UNITS	UNIT COST	TOTAL
1.0	CAPITAL COST				
1.1	Metals Affected Soil Area				
	Affected Soil Excavation	2,500	cubic yd	\$30.00	\$75,000
	Confirmation Sampling	100	ea	\$100.00	\$10,000
	Cap Area Soil Excavation	4,000	ton	\$2.50	\$10,000
	Cap Installation	4,000	sq ft	\$10.00	\$40,000
	Miscellaneous Site Work	10	EA	\$2,500	\$25,000
	Deed Restrictions	1	ea	\$10,000	\$10,000
	<i>Metals Affected Soils Area Subtotal</i>				<u>\$170,000</u>
	TOTAL ESTIMATED CAPITAL COST				\$170,000
2.0	INDIRECT CAPITAL COST				
	Engineering	10%	of	\$170,000	\$17,000
	Permitting	5%	of	\$170,000	\$8,500
	Contingency	20%	of	\$170,000	\$34,000
	<i>Indirect Capital Cost Subtotal</i>				<u>\$59,500</u>
	TOTAL INDIRECT CAPITAL COST				\$60,000
3.0	ANNUAL OPERATION AND MAINTENANCE				
	Cap monitoring, maintenance	1	LS	\$1,000	\$1,000
	Cap repair and amortization	25	SQ FT	\$10	\$250
	<i>Annual Operation and Maintenance Subtotal</i>				<u>\$1,250</u>
	TOTAL ESTIMATED O&M COST				\$1,300
	PRESENT WORTH OF O&M COST				\$19,000
	NET PRESENT WORTH OF ALTERNATIVE (rounded)				\$249,000

- Notes:
1. Present worth calculated at an 5% (interest minus inflation) rate for a period of 30 years.
 2. Deed restrictions on future use of property.
 3. Annual cap repair is approximately 5% per yer
 4. Cap repair cost provides allowance for amortization

TABLE 6-3
COST ESTIMATE
ALTERNATIVE 4 - EXCAVATION AND OFFSITE DISPOSAL
Investigation Area E
Mare Island Naval Shipyard

		Vallejo, California		UNIT COST	TOTAL
ITEM	DESCRIPTION	QUANTITY	UNITS		
1.0	CAPITAL COST				
1.1	Metals Affected Soil Area				
	Soil Excavation	2,500	cubic yd	\$30.00	\$75,000
	Confirmation Sampling	100	ea	\$100.00	\$10,000
	Buy, Haul, and Place Clean Backfill	2,500	cubic yd	\$50.00	\$125,000
	Hazardous Soil Disposal	4,000	ton	\$120.00	\$480,000
	Generator Fee	1	ls	\$2,871.00	\$2,871
	<i>Metals Affected Soils Area Subtotal</i>				<u>\$692,871</u>
	TOTAL ESTIMATED CAPITAL COST				\$693,000
2.0	INDIRECT CAPITAL COST				
	Engineering	10%	of	\$693,000	\$69,300
	Permitting	5%	of	\$693,000	\$34,650
	Contingency	20%	of	\$693,000	\$138,600
	<i>Indirect Capital Cost Subtotal</i>				<u>\$242,550</u>
	TOTAL INDIRECT CAPITAL COST				\$243,000
	NET PRESENT WORTH OF ALTERNATIVE (rounded)				\$936,000

Notes:

TABLE 6-4
EVALUATION OF REMOVAL ALTERNATIVES
Investigation Area E
Mare Island Naval Shipyard,
Vallejo, California

REMOVAL ACTION ALTERNATIVE	OVERALL PROTECTION OF HUMAN HEALTH AND ENVIRONMENT	COMPLIANCE WITH ARARS	LONG-TERM EFFECTIVENESS AND PERMANENCE	REDUCTION OF TOXICITY, MOBILITY, OR VOLUME	SHORT-TERM EFFECTIVE- NESS	TECHNICAL FEASIBILITY	ESTIMATED PROJECT COST	EVALUATION RESULT
1 No Action	None	No	None	No	Not Applicable	Excellent	none	Rejected
2 Institutional Controls	Good	Yes	Good	Good	Good	Excellent	\$18,000	Cost lowest relative to degree of protection and long term risks
3 Capping with Deed Restrictions	Excellent	Yes	Excellent	Excellent	Good	Excellent	\$249,000	High Cost relative to protection.
4 Excavation with Off- site Disposal	Excellent	Yes	Excellent	Excellent	Good	Excellent	\$936,000	Highest cost relative to degree of effectiveness

REMEDIAL ACTION PLAN
INVESTIGATION AREA E, MARE ISLAND NAVAL SHIPYARD

FIGURES

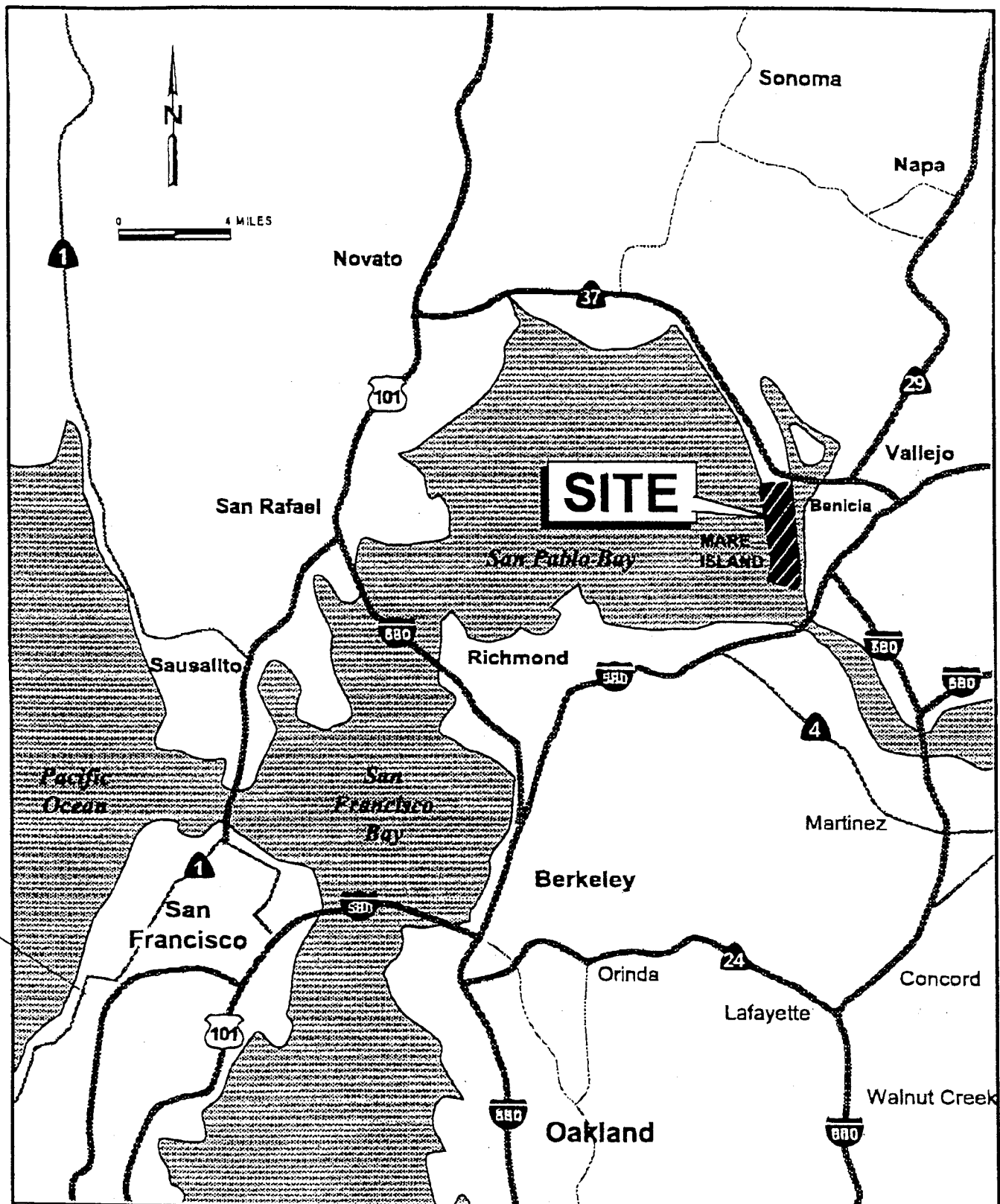


FIGURE 1-1

SITE LOCATION MAP

MARCH 2000

AREA E INVESTIGATION • MARE ISLAND, CALIFORNIA

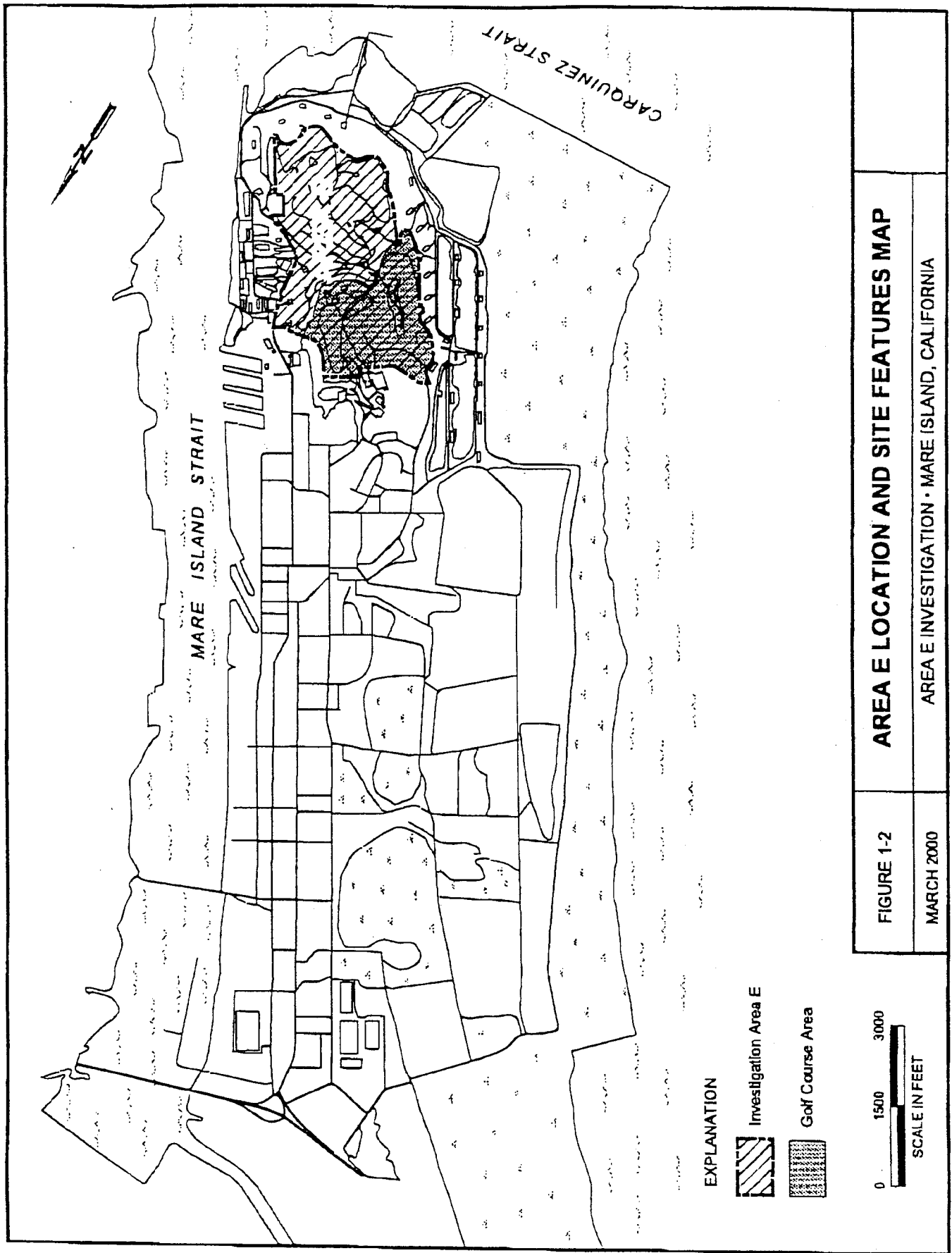
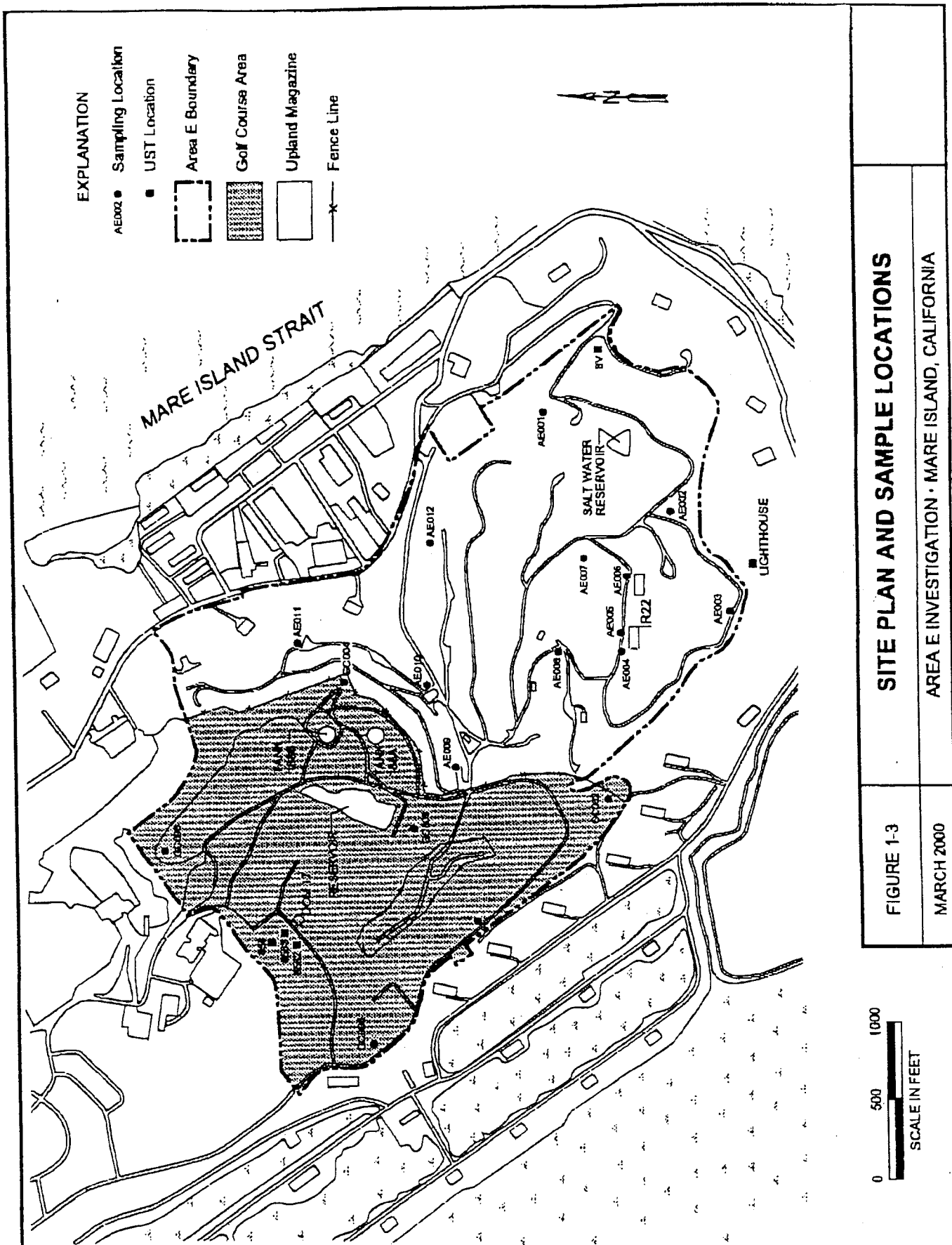


FIGURE 1-2	AREA E LOCATION AND SITE FEATURES MAP	
	AREA E INVESTIGATION • MARE ISLAND, CALIFORNIA	
MARCH 2000		



APPENDIX A

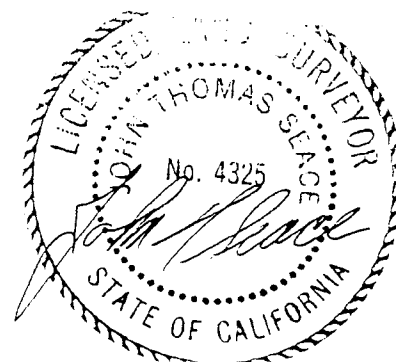
Legal Description and accompanying Plat Map for

Investigation Area E

**LEGAL DESCRIPTION
ENVIRONMENTAL AREA-E**

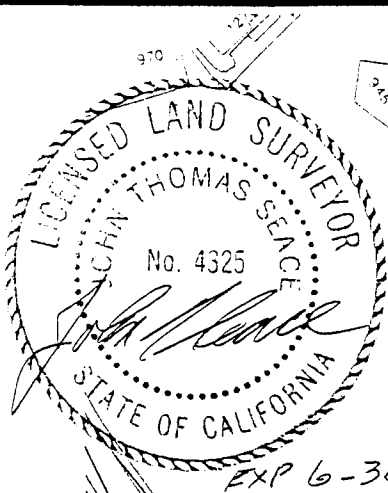
ALL THAT REAL PROPERTY SITUATE IN THE CITY OF VALLEJO, COUNTY OF SOLANO, STATE OF CALIFORNIA, DESCRIBED AS FOLLOWS:

BEGINNING AT A 2 ½" ALUMINUM DISK, AS SHOWN ON THAT CERTAIN RECORD OF SURVEY FILED IN BOOK 21 OF L.S.M., AT PAGE 94, ON NOVEMBER 14, 1996, SOLANO COUNTY RECORDERS OFFICE, STAMPED "MARE ISLAND CONTROL POINT, MC GILL-MARTIN-SELF, INC. ORINDA, CA., 27" FROM WHICH A STANDARD USC&GS BRASS DISK STAMPED "MARE ID SE 1852 1932" BEARS SOUTH 40°40'24" EAST 3449.80 FEET;
THENCE FROM SAID **POINT OF BEGINNING**, NORTH 11°58'15" EAST 427.38 FEET TO THE **TRUE POINT OF BEGINNING**;
THENCE FROM SAID TRUE POINT OF BEGINNING SOUTH 50°39'15" EAST, A DISTANCE OF 563.01 FEET;
THENCE SOUTH 65°56'50" EAST, A DISTANCE OF 210.09 FEET;
THENCE SOUTH 75°14'03" EAST, A DISTANCE OF 676.57 FEET TO THE BEGINNING OF A CURVE CONCAVE TO THE NORTHEAST HAVING A RADIUS OF 311.22 FEET AND A CENTRAL ANGLE OF 31°01'43" AND BEING SUBTENDED BY A CHORD WHICH BEARS SOUTH 36°27'12" EAST 166.49 FEET;
THENCE SOUTHERLY AND SOUTHEASTERLY ALONG SAID CURVE, A DISTANCE OF 168.54 FEET;
THENCE SOUTH 50°32'13" EAST, A DISTANCE OF 73.29 FEET TO THE BEGINNING OF A CURVE TANGENT TO SAID LINE;
THENCE OUTHEASTERLY A DISTANCE OF 98.72 FEET ALONG THE CURVE CONCAVE TO THE SOUTHWEST, HAVING A RADIUS OF 440.94 FEET AND A CENTRAL ANGLE OF 12°49'39" TO A POINT OF CUSP ON A CURVE, FROM WHICH THE RADIUS POINT BEARS SOUTH 57°13'27" WEST;
THENCE SOUTHEASTERLY AND SOUTHERNLY A DISTANCE OF 208.47 FEET ALONG THE ARC OF SAID CURVE CONCAVE TO THE WEST HAVING A RADIUS OF 225.85 FEET AND A CENTRAL ANGLE OF 52°53'11";
THENCE SOUTH 17°45'33" WEST, A DISTANCE OF 150.36 FEET TO THE BEGINNING OF A CURVE CONCAVE TO THE EAST HAVING A RADIUS OF 237.83 FEET AND A CENTRAL ANGLE OF 50°17'03" AND BEING SUBTENDED BY A CHORD WHICH BEARS SOUTH 02°07'39" EAST 202.09 FEET;
THENCE SOUTHWESTERLY, SOUTHERLY AND SOUTHEASTERLY ALONG SAID CURVE, A DISTANCE OF 208.73 FEET TO A POINT OF CUSP ON A CURVE, FROM WHICH THE RADIUS POINT BEARS NORTH 60°20'13" EAST;
THENCE SOUTHEASTERLY AND EASTERLY A DISTANCE OF 298.23 FEET ALONG THE ARC OF SAID CURVE CONCAVE TO THE NORTHEAST HAVING A RADIUS OF 301.98 FEET AND A CENTRAL ANGLE OF 56°35'06";
THENCE SOUTH 83°54'05" EAST, A DISTANCE OF 211.59 FEET;
THENCE SOUTH 71°26'37" EAST, A DISTANCE OF 781.97 FEET;
THENCE SOUTH 52°40'30" WEST, A DISTANCE OF 253.17 FEET;
THENCE SOUTH 36°50'15" EAST, A DISTANCE OF 345.71 FEET;
THENCE NORTH 52°53'25" EAST, A DISTANCE OF 170.12 FEET;



A CENTRAL ANGLE OF 47°38'42" AND BEING SUBTENDED BY A CHORD WHICH
 BEARS SOUTH 60°21'33" WEST 448.99 FEET;
 THENCE SOUTH 35°47'30" EAST, A DISTANCE OF 1052.52 FEET TO A POINT OF CUSP
 ON A CURVE ONCAVE TO THE SOUTHEAST HAVING A RADIUS OF 555.82 FEET AND
 THENCE WESTERLY AND SOUTHWESTERLY ALONG SAID CURVE, A DISTANCE OF
 462.19 FEET TO A POINT OF REVERSE CURVATURE;
 THENCE SOUTHWESTERLY AND WESTERLY A DISTANCE OF 616.80 FEET ALONG
 THE ARC OF SAID CURVE CONCAVE TO THE NORTHWEST HAVING A RADIUS OF
 752.61 FEET AND A CENTRAL ANGLE OF 46°57'25";
 THENCE NORTH 82°30'51" WEST, A DISTANCE OF 328.57 FEET;
 THENCE SOUTH 82°56'55" WEST, A DISTANCE OF 266.26 FEET;
 THENCE SOUTH 54°59'12" WEST, A DISTANCE OF 82.26 FEET;
 THENCE SOUTH 24°26'29" WEST, A DISTANCE OF 343.47 FEET;
 THENCE NORTH 84°44'12" WEST, A DISTANCE OF 105.49 FEET;
 THENCE NORTH 47°45'25" WEST, A DISTANCE OF 177.66 FEET;
 THENCE NORTH 67°39'41" WEST, A DISTANCE OF 147.93 FEET;
 THENCE NORTH 40°15'24" WEST, A DISTANCE OF 61.28 FEET;
 THENCE NORTH 01°47'44" WEST, A DISTANCE OF 140.95 FEET;
 THENCE NORTH 70°48'04" WEST, A DISTANCE OF 166.80 FEET;
 THENCE NORTH 34°08'32" WEST, A DISTANCE OF 159.21 FEET;
 THENCE NORTH 51°36'04" WEST, A DISTANCE OF 118.34 FEET;
 THENCE NORTH 36°43'28" WEST, A DISTANCE OF 185.38 FEET;
 THENCE SOUTH 76°10'50" WEST, A DISTANCE OF 321.13 FEET;
 THENCE SOUTH 01°32'10" EAST, A DISTANCE OF 77.52 FEET;
 THENCE SOUTH 39°43'31" WEST, A DISTANCE OF 76.49 FEET;
 THENCE NORTH 26°10'55" WEST, A DISTANCE OF 173.68 FEET;
 THENCE NORTH 66°01'19" WEST, A DISTANCE OF 97.06 FEET;
 THENCE SOUTH 45°15'47" WEST, A DISTANCE OF 175.27 FEET;
 THENCE SOUTH 58°29'55" WEST, A DISTANCE OF 105.59 FEET;
 THENCE NORTH 35°45'24" WEST, A DISTANCE OF 160.73 FEET;
 THENCE NORTH 09°13'43" EAST, A DISTANCE OF 227.28 FEET;
 THENCE NORTH 80°46'17" EAST, A DISTANCE OF 118.63 FEET;
 THENCE SOUTH 09°13'43" WEST, A DISTANCE OF 108.58 FEET;
 THENCE NORTH 35°42'24" WEST, A DISTANCE OF 232.63 FEET;
 THENCE NORTH 40°00'19" WEST, A DISTANCE OF 131.33 FEET;
 THENCE NORTH 09°06'20" EAST, A DISTANCE OF 210.23 FEET;
 THENCE NORTH 80°53'40" WEST, A DISTANCE OF 118.90 FEET;
 THENCE SOUTH 09°06'20" WEST, A DISTANCE OF 107.27 FEET;
 THENCE NORTH 40°00'19" WEST, A DISTANCE OF 28.28 FEET;
 THENCE NORTH 35°15'24" WEST, A DISTANCE OF 244.81 FEET;
 THENCE NORTH 09°10'57" EAST, A DISTANCE OF 215.40 FEET;
 THENCE NORTH 80°49'03" WEST, A DISTANCE OF 118.14 FEET;
 THENCE SOUTH 09°10'57" WEST, A DISTANCE OF 94.93 FEET;

THENCE NORTH 35°15'24" WEST, A DISTANCE OF 240.07 FEET;
THENCE NORTH 43°30'16" WEST, A DISTANCE OF 27.28 FEET;
THENCE NORTH 08°44'44" EAST, A DISTANCE OF 209.89 FEET;
THENCE NORTH 81°15'16" WEST, A DISTANCE OF 118.00 FEET;
THENCE SOUTH 08°43'35" WEST, A DISTANCE OF 118.56 FEET;
THENCE NORTH 43°30'16" WEST, A DISTANCE OF 312.06 FEET;
THENCE NORTH 39°03'12" WEST, A DISTANCE OF 344.52 FEET;
THENCE NORTH 08°05'06" WEST, A DISTANCE OF 205.57 FEET;
THENCE NORTH 47°35'22" WEST, A DISTANCE OF 236.08 FEET;
THENCE NORTH 57°42'28" EAST, A DISTANCE OF 170.53 FEET;
THENCE NORTH 82°47'56" EAST, A DISTANCE OF 561.80 FEET;
THENCE NORTH 50°23'58" EAST, A DISTANCE OF 586.21 FEET TO THE BEGINNING
OF A CURVE CONCAVE TO THE WEST HAVING A RADIUS OF 184.79 FEET AND A
CENTRAL ANGLE OF 102°58'42" AND BEING SUBTENDED BY A CHORD WHICH
BEARS NORTH 00°34'33" WEST 289.19 FEET;
THENCE NORTHEASTERLY, NORTHERLY AND NORTHWESTERLY ALONG SAID
CURVE, A DISTANCE OF 332.12 FEET TO A POINT OF CUSP;
THENCE NORTH 57°28'42" EAST, A DISTANCE OF 490.96 FEET TO THE POINT OF
BEGINNING. CONTAINING 209.279 ACRES, MORE OR LESS.



EXP 6-30-04

N80°34'34"W
289.19' (Chord)
USFS
22 LSM 59

TRUE POINT
OF BEGINNING

POINT OF BEGINNING
2 1/2" ALUM. DISK
MARE ISLAND CONTROL
POINT 27
(21 LSM 94)

MARE ISLAND GOLF COURSE
23 LSM 95

Scale: 1"=400'

OASIS Consulting
1807 Mariposa Way, Fairfield, CA 94503 (707) 428-8027

PLAT TO ACCOMPANY
LEGAL DESCRIPTION
FOR MARE ISLAND
INVESTIGATIVE AREA "E"
CITY OF VALLEJO
SOLANO COUNTY
CALIFORNIA

June 2000

MATCH LINE - SEE SHEET 2

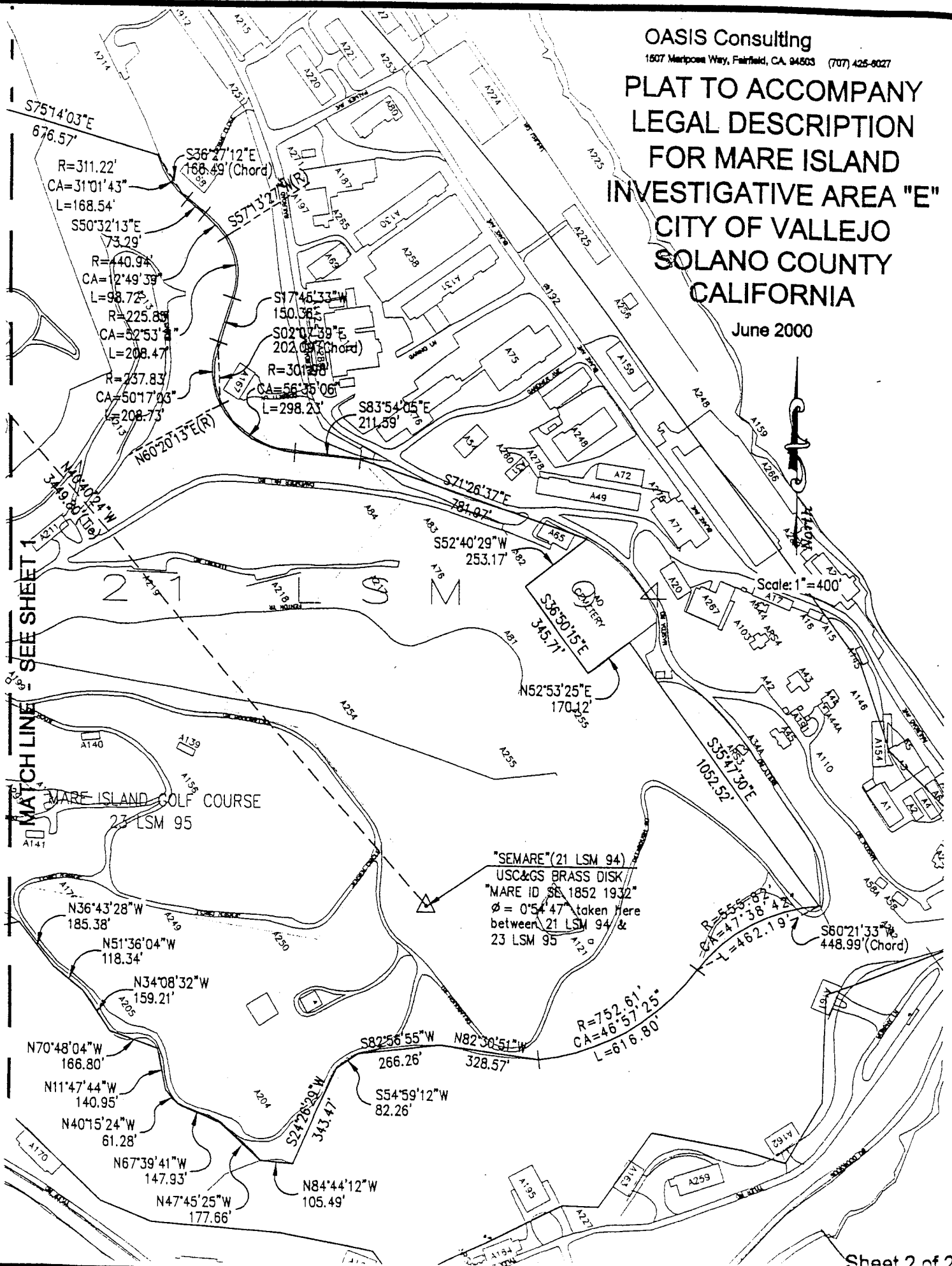
Sheet 1 of 2

OASIS Consulting

1607 Mariposa Way, Fairfield, CA. 94503 (707) 425-8027

PLAT TO ACCOMPANY
LEGAL DESCRIPTION
FOR MARE ISLAND
INVESTIGATIVE AREA "E"
CITY OF VALLEJO
SOLANO COUNTY
CALIFORNIA

June 2000



APPENDIX B

Legal Description and accompanying Plat Map for the Original 9-Hole Golf Course within Investigation Area E and Subject to the Land Use Covenant

Legal Description Original Mare Island Golf Course

ALL THAT REAL PROPERTY SITUATED IN THE CITY OF VALLEJO, COUNTY OF SOLANO, STATE OF CALIFORNIA, DESCRIBED AS FOLLOWS:

BEGINNING AT A USC& GS FIRST ORDER TRIANGULATION POINT BY A USC & GS STANDARD BRASS DISK STAMPED "MARE ID SE 1852 1932" AS SHOWN AND DELINEATED ON THAT CERTAIN RECORD OF SURVEY FILED FOR RECORD IN BOOK 21 L.S.M. AS PAGES 94 THROUGH 98 INCLUSIVE, SOLANO COUNTY RECORDS, FROM WHICH A 2 1/2" ALUMINUM DISK STAMPED "MARE ISLAND CONTROL POINT, MCGILL-MARTIN-SELF, ORINDA, CA., #3" BEARS NORTH 35 DEGREES 54 MINUTES 10 SECONDS WEST 17,225.54 FEET; THENCE FROM SAID POINT OF BEGINNING, NORTH 31 DEGREES 39 MINUTES 25 SECONDS WEST 2007.33 FEET TO THE TRUE POINT OF BEGINNING;

THENCE FROM SAID TRUE POINT OF BEGINNING; SOUTH 72°37'22" WEST, A DISTANCE OF 471.70 FEET;

THENCE SOUTH 87°31'18" WEST, A DISTANCE OF 228.81 FEET;
THENCE SOUTH 09°59'11" WEST, A DISTANCE OF 444.92 FEET;
THENCE SOUTH 14°41'41" EAST, A DISTANCE OF 191.89 FEET;
THENCE NORTH 69°52'45" WEST, A DISTANCE OF 267.26 FEET;
THENCE NORTH 43°17'22" WEST, A DISTANCE OF 942.27 FEET;
THENCE SOUTH 49°26'07" WEST, A DISTANCE OF 283.60 FEET;
THENCE SOUTH 41°43'57" EAST, A DISTANCE OF 1026.50 FEET;
THENCE SOUTH 89°55'46" EAST, A DISTANCE OF 137.28 FEET;
THENCE NORTH 09°00'19" WEST, A DISTANCE OF 222.05 FEET;
THENCE SOUTH 75°35'03" EAST, A DISTANCE OF 342.14 FEET;
THENCE SOUTH 13°53'57" EAST, A DISTANCE OF 327.93 FEET;
THENCE SOUTH 02°05'14" EAST, A DISTANCE OF 362.99 FEET;
THENCE SOUTH 15°07'32" WEST, A DISTANCE OF 358.15 FEET;
THENCE NORTH 66°01'19" WEST, A DISTANCE OF 97.06 FEET;
THENCE NORTH 51°00'17" WEST, A DISTANCE OF 572.57 FEET;
THENCE NORTH 37°16'29" WEST, A DISTANCE OF 712.84 FEET;
THENCE NORTH 73°07'09" WEST, A DISTANCE OF 108.66 FEET;
THENCE NORTH 39°19'37" WEST, A DISTANCE OF 126.53 FEET;
THENCE NORTH 28°09'28" EAST, A DISTANCE OF 77.05 FEET;
THENCE NORTH 35°34'57" WEST, A DISTANCE OF 154.65 FEET;
THENCE NORTH 72°29'23" WEST, A DISTANCE OF 293.60 FEET;
THENCE NORTH 43°30'16" WEST, A DISTANCE OF 94.70 FEET;
THENCE NORTH 39°03'12" WEST, A DISTANCE OF 344.52 FEET;
THENCE NORTH 08°05'06" WEST, A DISTANCE OF 205.57 FEET;
THENCE NORTH 47°35'22" WEST, A DISTANCE OF 236.08 FEET;
THENCE NORTH 57°42'28" EAST, A DISTANCE OF 170.53 FEET;
THENCE NORTH 82°47'56" EAST, A DISTANCE OF 561.80 FEET;
THENCE NORTH 50°23'58" EAST, A DISTANCE OF 586.21 FEET TO THE BEGINNING OF A CURVE CONCAVE TO THE NORTHWEST HAVING A RADIUS OF 184.79 FEET AND A CENTRAL ANGLE OF 29°49'16" AND BEING SUBTENDED BY A CHORD WHICH BEARS NORTH 36°00'03" EAST 95.10 FEET; THENCE NORTHEASTERLY AND NORTHERLY ALONG SAID CURVE, A DISTANCE OF 96.18 FEET TO A POINT OF CUSP;
THENCE SOUTH 31°44'04" EAST, A DISTANCE OF 40.19 FEET;
THENCE SOUTH 57°59'06" EAST, A DISTANCE OF 66.64 FEET;
THENCE SOUTH 73°35'49" EAST, A DISTANCE OF 43.76 FEET TO THE BEGINNING OF A CURVE CONCAVE TO THE NORTH HAVING A RADIUS OF 200.00 FEET AND A CENTRAL ANGLE OF 20°34'46" AND BEING SUBTENDED BY A CHORD WHICH BEARS NORTH 84°23'36" EAST 71.45 FEET;



EXP 9-30-2000

THENCE EASTERLY ALONG SAID CURVE, A DISTANCE OF 71.84 FEET;
THENCE NORTH 46°29'46" EAST, A DISTANCE OF 56.41 FEET;
THENCE NORTH 33°05'20" EAST, A DISTANCE OF 54.45 FEET;
THENCE NORTH 20°17'11" EAST, A DISTANCE OF 44.37 FEET;
THENCE NORTH 10°39'07" EAST, A DISTANCE OF 45.94 FEET;
THENCE NORTH 10°30'27" WEST, A DISTANCE OF 62.38 FEET TO THE BEGINNING OF A CURVE
CONCAVE TO THE SOUTHWEST HAVING A RADIUS OF 212.00 FEET AND A CENTRAL ANGLE OF
31°06'33" AND BEING SUBTENDED BY A CHORD WHICH BEARS NORTH 36°19'28" WEST 113.70
FEET;
THENCE NORTHERLY AND NORTHWESTERLY ALONG SAID CURVE, A DISTANCE OF 115.11 FEET;
THENCE NORTH 77°01'08" WEST, A DISTANCE OF 50.27 FEET;
THENCE SOUTH 89°29'23" WEST, A DISTANCE OF 49.06 FEET;
THENCE NORTH 32°31'18" WEST, A DISTANCE OF 49.57 FEET;
THENCE NORTH 57°28'42" EAST, A DISTANCE OF 324.26 FEET;
THENCE SOUTH 50°39'15" EAST, A DISTANCE OF 563.01 FEET;
THENCE SOUTH 65°56'50" EAST, A DISTANCE OF 210.09 FEET;
THENCE SOUTH 58°56'39" WEST, A DISTANCE OF 47.88 FEET;
THENCE SOUTH 31°12'31" EAST, A DISTANCE OF 1003.80 FEET TO THE TRUE POINT OF
BEGINNING CONTAINING 76.955 ACRES, MORE OR LESS.



Exp 9-30-2000

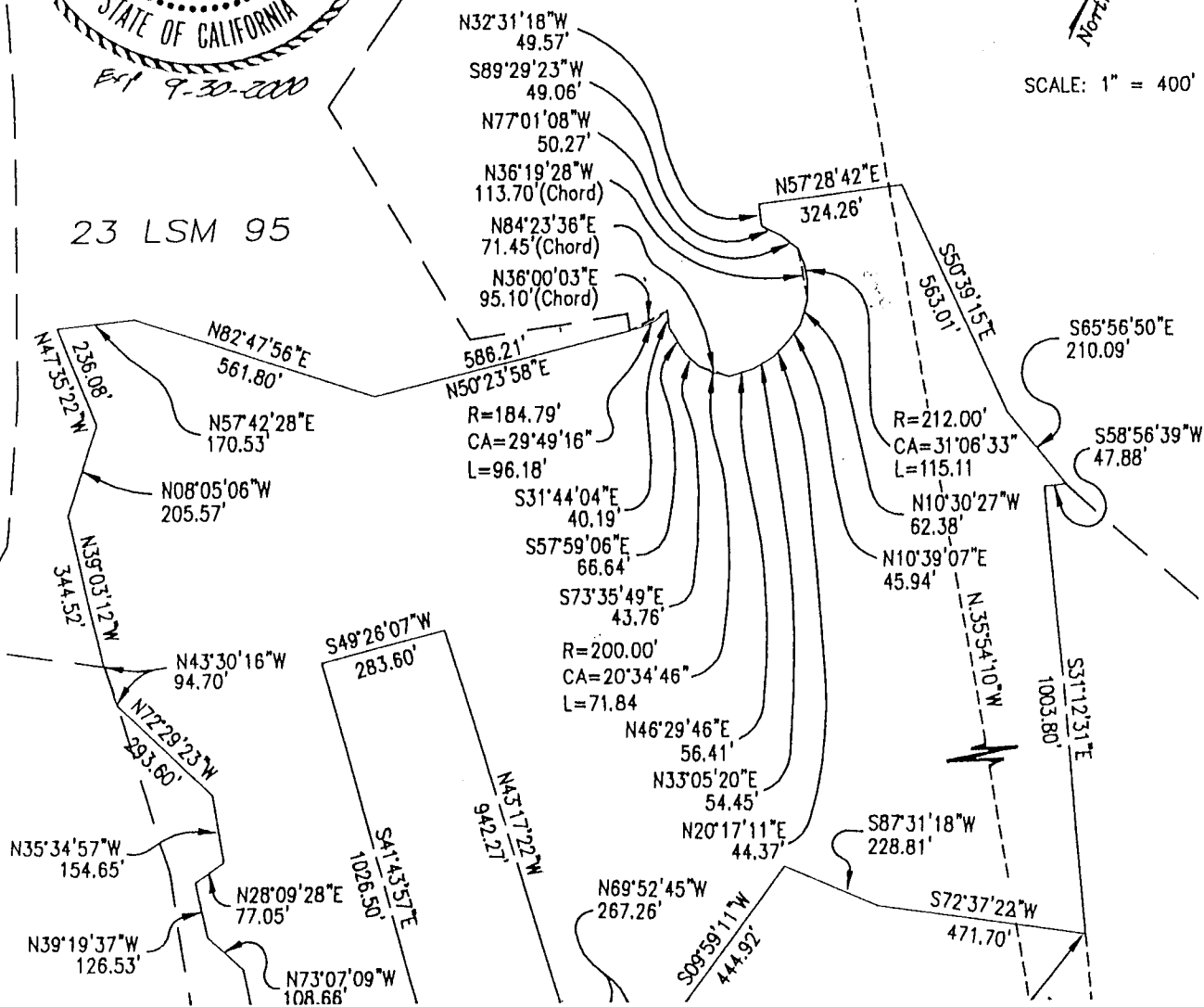
HCN 3, FOUND 2 1/2" ALUMINUM DISK
STAMPED " MARE ISLAND CONTROL POINT,
McGILL-MARTIN-SELF, INC. ORINDA, CA.
3, PER 21 LSM 94.

22 LSM 59

23 LSM 95

21 LSM 94

WARE ISLAND



APPENDIX C

Preliminary Nonbinding Allocation of Responsibility



Department of Toxic Substances Control



Winston H. Hickox
Agency Secretary
California Environmental
Protection Agency

Edwin F. Lowry, Director
700 Heinz Avenue, Suite 200
Berkeley, California 94710-2721

Gray Davis
Governor

PRELIMINARY NONBINDING ALLOCATION OF RESPONSIBILITY

Health and Safety Code (HSC) section 25356.1(e) requires the Department of Toxic Substances Control (DTSC) to prepare a preliminary nonbinding allocation of responsibility (the "NBAR") among all identifiable potentially responsible parties (PRPs). HSC section 25356.3(a) allows PRPs with an aggregate allocation in excess of 50% to convene an arbitration proceeding by submitting to binding arbitration before an arbitration panel. If PRPs with over 50% of the allocation convene arbitration, then any other PRP wishing to do so may also submit to binding arbitration.

The sole purpose of the NBAR is to establish which PRPs will have an aggregate allocation in excess of 50% and can therefore convene arbitration if they so choose. The NBAR, which is based on the evidence available to the DTSC, is not binding on anyone, including PRPs, DTSC, or the arbitration panel. If a panel is convened, its proceedings are de novo and do not constitute a review of the provisional allocation. The arbitration panel's allocation will be based on the panel's application of the criteria spelled out in HSC section 25356.3(c) to the evidence produced at the arbitration hearing. Once arbitration is convened, or waived, the NBAR has no further effect, in arbitration, litigation or any other proceeding, except that both the NBAR and the arbitration panel's allocation are admissible in a court of law, pursuant to HSC section 25356.7 for the sole purpose of showing the good faith of the parties who have discharged the arbitration panel's decision.

DTSC sets forth the following preliminary nonbinding allocation of responsibility for the Mare Island Naval Shipyard, Vallejo, Solano County:

The Department of the Navy is allocated 100% responsibility.

APPENDIX D

Transcript of Public Meeting

MARE ISLAND NAVAL SHIPYARD
RESTORATION ADVISORY BOARD (RAB) MEETING MINUTES
Held May 25, 2000

Welcome and Introductions:

The March 2000 meeting of the Restoration Advisory Board (RAB) was called to order at 7:05 p.m. by Myrna Hayes, Community Co-chair and representative of Save San Pablo Baylands. Thirteen (13) RAB members, twenty-four (24) guests and community members, two (2) RAB support and community relations staff from Gutierrez-Palmenberg, Inc. (GPI), and one (1) recorder were present. The following RAB members were in attendance:

- Ms. Myrna Hayes • Mr. Ken Barden • Mr. Ken Kloc
- Mr. Jerry Dunaway • Ms. Cynthia Marquez • Mr. Ken Browne
- Ms. Diana Krevsky • Mr. John Cerini • Mr. Chip Gribble
- Mr. Adam Chavez • Ms. Paula Tygielski • Mr. James O'Loughlin
- Mr. Rob Schonholtz • Mr. Jerry Karr

Recorder: Ms. Kathy Langstaff

Ms. Myrna Hayes - Good evening. My name is Myrna Hayes, and I'm the community co-chair for the Restoration Advisory Board for Mare Island. And I congratulated all of us last month for being at this arduous task for six years, and that this is my six-year anniversary as the community co-chair, so you can boo or you can take my place.

(The RAB and community members introduced themselves.)

Public Meeting: Areas E and A1 Remedial Action Plans

Mr. Chip Gribble - Good evening. My name is Chip Gribble, the project manager for California Department of Toxic Substances Control, overseeing environmental restoration at Mare Island. I want to thank all of you for coming here tonight, and I am grateful for all your efforts to help insure that I and my agency do our job to protect public health and the environment.

This meeting tonight is a public meeting – rather the first part of this meeting is a public meeting to discuss the environmental investigations, conclusions, and draft remedial action

plans for two areas on Mare Island: Investigation Area E, located on the hill in the southern end of the -- of the island, and Investigation Area A1, clean parcels, located at the northern part -- northern part of Mare Island.

For environmental-management purposes, Kelly Ryan from Tetra Tech is going to help me with the presentation. And by the way, the fact sheet and the presentation tonight were prepared with the help of Tetra Tech, and we appreciate the help.

Here's a map of the investigation areas. For environmental-management purposes, Mare Island has been geographically subdivided into about 15 investigation areas, which you can see from this map, and you should have a handout with the slides and the overheads that we're going to use tonight as well. We often use the acronym IA for the two words "investigation area."

At this point, I'd like to go over the agenda briefly. First I'd like to give a brief overview of the RAP/ROD process, our environmental cleanup process, and then move on to a presentation discussion on the Investigation Area E remedial action plan, followed by questions and comments. Depending on the time, we could take a break at that point, and then proceed to do the same for Investigation Area A1, clean parcels, with a presentation followed by discussion and comments. At the end of that, another break, and then we would continue on with the abbreviated RAB meeting for the Restoration Advisory Board.

Q. Mr. Chip Gribble - Does that sound agreeable? Would anybody rather have a different order for any reason?

A. Ms. Myrna Hayes - No.

Mr. Chip Gribble - Sounds okay. And if anybody has questions as I go along, please feel free to ask questions throughout the presentation. Don't feel obliged to wait until the end. Next presentation slide. Here's a map of the two areas that we're going to be discussing for the remedial action plans tonight: at the southern end of the island, the hill, which is Investigation Area E, and highlighted at the top is Investigation Area A1, clean parcels.

Investigation Area A1, clean parcels, is a subset of Investigation Area A1. What we've done is carve out some of the contaminated areas in A1 and left those aside so we can move forward with the remainder of Investigation Area 1, which we think is clean and suitable for no further action.

I would like to walk you through the regulatory process to allow you to participate more effectively in this whole process by having a basic understanding of the process. This is a general overview, not necessarily specific to what we've done here. In general, we start with what's called preliminary assessment, where we review records. We gather information that's available in our files. We sometimes talk to former shipyard workers or former workers at a particular site and gather all the available, easily obtainable information on the site so that we

have an idea of the history and the possible issues.

We can follow that up with an SI (site inspection), where we will typically take a limited number of samples to get a further refined idea of what the issues are that we need to address. That generally isn't enough to characterize the site. That gives us a clue as to what we need to do and what we need to look further for. So then we'll follow on with a more intensive investigation, which is called a remedial investigation.

By the way, there's an acronym that goes with that called a PASI, which is a federal term, and the state term is a PEA, preliminary environmental assessment. They're essentially equivalent, but they're different acronyms for the state equivalent and the federal equivalent.

The next step of the process is the remedial investigation, which generally involves extensive sampling and data analysis to evaluate quantitatively the risk that's posed by the contamination of the site, assuming that we have contamination and get that far. At the point where we've characterized the site in terms of the extent of contamination, the levels of contamination, and the risk that follows from that, we then consider a number of possible remedies to address that risk, reduce the risk, or mitigate the risk. We call that a feasibility study. We evaluate a number of different remedial options.

Following that, we get to where we are tonight on two areas, which is the remedial action plan – the acronym for that is a RAP – and the federal equivalent term is Record of Decision (ROD). At this point, it's a draft document. We put that in front of the public. We're required to submit that to the public for a 30-day comment period. We are also required to hold a public meeting to give the public an opportunity to comment on those and to hear what we have to say about those documents.

The 30-day comment period on these documents started on May 10 and will end on June 10. All the comments that we receive, by the way, we will respond to in writing. They will be part of the record, and following that comment period, we will then make a determination on whether or not we go forward and approve those documents as final or make changes based on what has transpired in the public-comment period.

So following the remedial action plan, we don't necessarily have the remediation addressed. Sometimes the remedial action plan typically says that certain actions need to be taken to clean up the site, and at that point we move into a remedial design and remediation phase, which is then followed by a long-term monitoring. Once all the remedial actions have been taken that have been specified in the remedial action plan, we then certify that all remedial actions have been taken, and from our perspective, at that point the property is eligible for transfer.

The Navy will generate a document called a FOST, Finding of Suitability to Transfer, where we will review that document, and if it says what we think is appropriate, we would concur

or approve of that FOST, and then, by the Navy's process, they would then be able to transfer the property.

Q. Mr. Chip Gribble - Are there any questions on the basic process?

(No questions were asked.)

Mr. Chip Gribble - Okay. Let's move on to the Investigation Area E presentation. The draft remedial action plan that we put out says that we think we've addressed all the environmental issues. There is one issue on the hill which we think calls for a remedy - a limitation on the use of the property for the original nine-hole course. That's what we're proposing for the remedy for Investigation Area E.

The Navy has done a lot of work, and we've done a lot of work with the Navy, to get to the point where we've drawn that conclusion, and I'd like to go over that at this point. The Navy investigated Investigation Area E, the hill, for unexploded ordnance, as I think we all know we've been talking about that a long time here. Unexploded ordnance is a big issue at Mare Island. The Navy's been working on for several years on this project. This was a question for Investigation Area E.

The Navy did a survey, which included a site walk, geophysical surveys, and excavation of all the anomalies that they identified in the surveys. What they found in all of that was that there were no unexploded ordnance items found in the hill through the site walk. There were several anomalies that were identified. Those were all excavated, and none of those were determined to be unexploded ordnance or ordnance-related type of material.

In addition to that, there was an ordnance reservoir on top of the hill. It was not a place that ordnance was stored, despite the name. It was a place where the Navy stored water to fight fires, but the term that's often used is ordnance reservoir. That ordnance reservoir was drained. It was mucked out with the thought that there might be some ordnance or explosive waste or some evidence of that history at the bottom of that reservoir. None of that was found in the bottom of the ordnance reservoir. I think a bicycle was found, a cigarette machine, some stuff like that. I think there were three or four spent bullets, and that was essentially it.

So the conclusion with that investigation was that there was no ordnance on the hill. Based on the history of the site, the geology of the site, and a lot of other factors, we conclude that there is no residual concern from unexploded ordnance on the hill. This will be in contrast to what we will eventually say at some point about the lowlands, and particularly the dredge ponds or other areas where we have had a history of unexploded ordnance found.

We think this is different in that there is no residual risk, that the soil cover there is a very thin soil cover which is underlain with weathered bedrock, and for the Navy to have disposed of any ordnance up there, they would have thrown it over the side of a truck. It would have

been found on the surface. None of that was found. Or they would have had to excavate or dig through this weathered bedrock to make a pit in which this material could be disposed, and none of that was found in our surveys.

Further, when the Navy did want to dispose of ordnance, it would have been likely for them to have just gone to the water's edge and thrown it over the water's edge or disposed of it in one of the low-lying areas where stuff was disposed of. It would have been unusual for somebody to go to the length of digging a hole on the hill to dispose of the stuff when they had so many easy opportunities at low-lying areas. So we think that the probability of unexploded ordnance being found up on the hill is essentially nonexistent or no different than we would find anywhere else in the City of Vallejo or any other community.

So from our perspective, we don't think there is any residual risk and any residual concern from unexploded ordnance on the hill. Polychlorinated biphenyls, PCB – the Navy had a program to investigate sites throughout Mare Island where, based on the historical use of materials or electrical equipment, that there was some possibility of PCB contamination. This includes, for the most part, electrical substations, transformers, and other electrical equipment.

The Navy submitted reports on that, and we've evaluated that and concluded that there is no risk from residual PCBs up in Area E. There was one transformer site which was an outdoor site which did have a PCB-leakage problem. The Navy decontaminated the equipment that was up there. The concrete pad that it sat on was also decontaminated. Typically what the Navy does for the concrete slabs is to scabble or remove the surface layer of concrete down to a point where chip samples indicate that there's no residual PCB in the concrete slab.

In addition, at this particular site, soil was excavated around the perimeter because PCBs have run off the top of the slab, and the PCBs were found to extend, I think, about two feet out from the slab and some number of feet down. So there was basically a trench excavated around the perimeter of this transformer site, and the PCB-contaminated material was removed. A fairly limited site in terms of extent.

The radiological surveys for the shipyard, most of that work is already completed, but tonight we're just talking about Investigation Area E and part of A1. The radiological series that the Navy did were very extensive and involved a significant amount of sampling and surveying for every possible question that they could come up with and that we could generate as well, and in our team of regulators doing the oversight for that program, we had several people, several agencies involved, Department of Health Services, the U.S. EPA and our agency, and we feel that that was an excellent job that the Navy did. There was no contamination that was found in Investigation Area E in all of those surveys.

The surveys did extend to the possibility that material may have leaked onto roadways off of trucks passing in and out of the shipyard. Nothing like that was found. Sewers were also

sampled, as well as all the buildings and structures in areas where we could identify as having any radiological history.

And by the way, I'd like to identify one person in the audience here who played a significant role in that. Steve Dean from the US EPA, if you'd stand up and let yourself be known. Steve played a major role in that and in our efforts to oversee the Navy's radiological surveys.

Another program that the Navy had to address was for underground storage tanks. For the most part, the underground storage tanks and petroleum hydrocarbon issues focused on five sites that were identified in a database that had been generated over the years, which was a collection of all the sites that had been mentioned in any previous report or sites that had known underground storage tanks. Many of the sites that were listed in this database are phantom sites generated from contradictory reports, mistakes in previous reports of titling various sites. So a number of sites that are listed in there are actually duplicates of other sites, and some sites that are phantom sites.

In Investigation Area E there were five listings. One of those was a 500-gallon heating-oil tank, which was removed. By the way, all the tanks on Mare Island that have been identified have been removed. Another was the lighthouse, which the Navy investigated and was not able to locate any UST in that location. A number of the structures that used to be in that part of Investigation Area E have long since been removed, and trying to find some of these possible USTs is a difficult task.

There was another tank, No. 658, which was removed, and that was a 100-gallon diesel tank which was determined by the Water Board as a low-risk site, and then there was one other tank site that we determined to be a phantom site, and one more which was found to be nothing but a former water cistern that was not used to store hydrocarbon at a later date. So all the UST issues in Investigation Area 11 E were resolved.

The next item on the overhead is lead in soil from lead-based paint. This has been a difficult issue between the agencies and the Navy or DoD in general where we think that this is an issue that needs to be addressed, and the Navy hasn't always agreed with us. However, for some parts of the island, EPA had a contractor at the time, which was Weston, who was a contractor to EPA at the time, who went out and did a study and an evaluation in some parts of Mare Island, including Investigation Area E, and several structures in Area E and A1 were sampled and evaluated for possible lead contamination in soil from lead-based paint.

In Investigation Area E, there were two buildings that were found to have significant lead contamination. And, Kelly, is there a photograph of the water tanks?

Ms. Kelly Ryan - Yes. Do you want to skip ahead to that? It's 2 R.

Mr. Chip Gribble - The photograph there, yes. Significant lead contamination was found in the

soil surrounding these two tanks, and unlike some other areas at Mare Island where we've had our struggles with the Navy over this issue in particular, the Navy did do a soil removal around these two structures to remove the contaminated soil. And the residual levels were, on average – somewhere in the neighborhood of 350 parts per million – below our general screening level of 400 parts per million. We think that's an acceptable residual contamination for unrestricted use.

We can go back to the slide with the bullets. Okay, at the last RAB meeting, I talked about the different sites and different categories that the Navy has. Initially the Navy had 24 IR sites, which we later called our Group 1 sights, and subsequently, we did other rounds of site identification, and we called those Group 2 and Group 3 sites.

In Investigation Area E, there is one Group 1 site which is called IR 22, which consists of two ordnance storage bunkers in the hill. The site was identified as an IR site because at one point somebody identified white powdery substance on the floor inside the bunker. The material was sampled and removed and thought to be a pesticide material. The concrete floor was chip-sampled subsequently, and some very low levels of pesticides were found in the concrete. Since the floor was cleaned, that white powdery substance was removed, and the residual contamination of pesticides was very low. We felt that was the end of that concern.

However, it was brought to our attention that outside of the bunker lead tags were found in the soil, and these were presumably from seal tags that had been used on ordnance storage boxes and that were ripped off or fell off and were found in the drainage ditches outside of these two bunkers in particular and possibly some of the other bunkers up in the hill. The soil outside these two bunkers was removed down to what was below that, an underlying asphaltic pavement, and we concluded that that problem was eliminated. The Navy also did sampling for lead in the drainage ditches elsewhere in the hill, did find lead contamination, but below the screening levels that we've already discussed.

The last bullet up here is the golf course, which was an unusual site. The Navy did some sampling at the golf course with the understanding that pesticides had historically been used at the golf course, and this is a place where we would likely find pesticide residual contamination. We did some limited sampling up there. Most of the samples were found to show very low levels of pesticide contamination or negligible contamination, except one where we found significantly high concentrations of arsenic from an arsenical pesticide. And the peak concentration I think was 541 parts per million.

That particular contaminated location was excavated, and that contaminated soil was removed. It was found to extend down to about two-plus feet, and I think the excavation hole was about 20 foot by 20 foot, and the residual levels were consistent with other parts of the golf course, where we found no or marginal contamination, close to our ambient concentration of, I think, 16.

Because of the way pesticides were used on the hill and the very localized nature of this particular deposit, we think that there is a reasonable probability that the arsenic-contamination locations exist on the original nine-hole course, but that the extent of these peak-concentration areas is so limited that, to find them we would have to grid off the entire original nine-hole course on a square-foot basis to be able to have a reasonable assurance that we would have identified all those locations.

That being what we felt was unrealistic and also what we felt was a reasonable probability that there are other limited locations on the golf course that have that kind of concentration of arsenic, which we think is acceptable for the intended use of the golf course or that kind of a type of a public use, but not acceptable for unrestricted use – that because of that, we're proposing, in our remedial action plan, a land-use covenant which would limit the use of the original nine-hole course to prohibit residential development and other sensitive uses, such as daycare centers and schools. That remedy extends only to the original nine-hole course and for the only contaminant of consequence from our perspective, which is arsenic.

So with that residual risk from arsenic, we did go through an evaluation of alternatives. Several alternatives were evaluated. One was no action, which obviously is not acceptable because of the risk that is posed by that contamination of arsenic for unrestricted use. We also considered capping the original nine-hole course. I think there's a practical and cost-limitation factor there which was a consideration.

And another one was an excavation, which would also be expensive and somewhat impractical to excavate the top level of soil throughout the nine-hole course. And that's how we concluded that, in our view, an appropriate remedy for this is the land-use covenant to limit the future use of the golf course.

That's my presentation for Area E, and hopefully we'll have some questions from the audience. Give me one question. Give me a hard question.

- Q. Mr. Dennis English- I have a question. You mentioned earlier that you have a hesitance. Did you do a preliminary endangerment assessment?
- A. Mr. Chip Gribble - Because of the way a lot of this work was done when the shipyard was going through closure, the shipyard at the time had roughly 3,000 employees. It was going down all the time. The Navy was trying to keep them busy and productive, and some of the ways in which they wanted to do that was to use them in the radiological surveys and the unexploded ordnance work and the PCB-program work and the underground storage program, and we thought that was a good way to go.

We agreed with that, that that was a considerable resource, that if we worked with the Navy and their resources or the skills that that remaining workforce had, that we could benefit greatly from that. So what we did was we organized what you would ordinarily find as a PASI document, a Preliminary Assessment Site Inspection, or the state equivalent of a PEA

document. Instead of having one nice, neatly packaged document with all those issues in it as a PEA or a PASI, we have several reports from each of these programs addressing the issues that were dealt with in that program.

If you take this collection of miscellaneous documents and you put them all together, you will have the equivalent of a PEA or PASI document, and in some cases the equivalent of an RI document depending on what levels of work was done to address the question at that particular location. For example, IR 22 was more of a PEA evaluation.

Mr. Dennis English - Well, I just believe that the PEA preliminary. . . . According to the state's preliminary endangerment process assessment, there's accountability to that study so that a person who has done the study is held accountable for any problems that may occur in the future. So it's just a suggestion -- if you go for the state's way of doing things, but I guess you already went ahead and did it a different way, which hopefully there still is accountability for those who did the surveys, which are severe if you don't do it properly.

Q. Mr. Chip Gribble - Can you expand on your point of accountability?

A. Mr. Dennis English - Accountability would be if studies were done improperly, or I believe the county EPA people know what I'm talking about, and also the Department of Toxic Substance Control. They have rigid guidelines on how to do these assessments, and if it was a consulting firm or even public officials or a staff doing the work, they have to be certified in certain areas, and they also have to stand by their work, and the work has to be evaluated. And if there are some problems found through certain discrepancies or whatever, there are criminal and civil penalties. So I'm just trying to find out if that was what you did, but --

C. Mr. Chip Gribble - That's a good point. By the way, I work for Department of Toxic Substance --

Mr. Dennis English- Oh, great.

Mr. Chip Gribble - I wish the Navy were giving this presentation. As far as accountability goes, some of those requirements, such as people doing radiological surveys or radiological work in the State of California or -- if I may speak for DHS -- I shouldn't speak for DHS, but my understanding is that Department of Health Services requires that those people or those firms be registered or licensed with Department of Health Services of the State of California, for example.

The Navy's radiological workers and their radiological team were not certified. They were not required to be certified because they were -- if I understand this correctly -- because they're federal employees on the federal property on a military site, and that registration or legal requirement didn't apply to Mare Island.

As I understand it, those people who used to work in that program, who have now moved on to civilian sector and are now private contractors working on other military sites, are now required to be certified with Department of Health Services, but the essence of that

requirement and those types of requirements is really to help ensure that the people doing that work are qualified. And in this case, we felt that they were extremely well qualified.

I would say that also for the unexploded ordnance program. These people were specialists. Their professional career for the most part was in military service dealing with ordnance. I can't come close to that kind of qualification myself. In some areas, the PCB program in particular, and the UST program, many of the people who were working in those programs were Navy people or former Naval shipyard employees who had gone through retraining programs and had some ability to do that work, or shall we say people within their program had the ability to do that work as other people were learning on the job.

So to the extent that we've approved this work, we think that it was done in some cases excellently and other cases satisfactorily. I wouldn't say excellent for everything. I don't think you would say excellent about my work for everything either, but we are comfortable in our conclusion. Any other? Ken?

Q. Mr. Ken Kloc - A couple of questions. In the upland magazine area, are those bunkers going to be demolished?

A. Mr. Chip Gribble - Well, I don't know officially. The developer who will get that property eventually, the golf course specifically, will keep some of those, if not all of them. And I don't know what he plans to do with them. I think some of them he's using for storage right now, but my understanding is that he's not going to be tearing them down. But that's really not for me to say. I don't know that for certain.

Q. Mr. Ken Kloc - And then, were there any lead-based-paint issues at those bunker structures?

A. Mr. Chip Gribble - For the most part, the bunkers are concrete, and they're mostly buried in the hillside or they're dug out of the hillside and then with a soil crown on top of it. So most of them have very little exposed concrete surface and very little exposed paint surface.

Q. Mr. Ken Kloc - And then one last question. In the negative declaration, it says that the environmental, or ecological-risk, assessment for the upland magazine area revealed potential ecological risks due to lead, and then it says DTSC considered several other factors and concluded that there was no significant ecological risk. And I was wondering if you could explain a little bit more what those other factors were.

A. Mr. Chip Gribble - If I may, Jim Polisini is an eco-toxicologist from our department, and I'd like to refer that question to Jim, please.

A. Mr. Jim Polisini - I worked on the eco-risk assessment, the review of it anyway. Basically, what we looked at was the area at the top of the hill. The source of lead appeared to be those tags that Chip mentioned that were apparently torn off the bags or fell off the bags when the bags were taken out at the ammunition-storage area.

So what we looked at was, number one, what's the distribution of lead tags? And as Chip said, a lot of that soil was taken out. There was still some lead in the soil, but the distribution

of lead concentrations was fairly spotty. I don't know how statistical you want to get about this, but there were some high areas and some low areas. And basically any ecological receptor, if it's like a mouse or something like that, is not going to stay in one place for its whole life. So it's going to move around. Even if it stays in the area of the ammunition, it's going to move around that. So its exposure averaged out over that area would be less than the maximum obviously.

And the other thing we looked at was bioavailability in that those tags would be elemental lead, which is not as highly available as the lead used in toxicity experiments. So even if it, over a period of time, weathered and became more bioavailable, it's not going to be as toxic as the lead used in the experiments in the ecological-risk assessment.

So given those factors, we thought the bioavailability, the patchiness of the lead concentration, and the removal action, that those actions were sufficient in terms of eco risk. Plus the habitat surrounding those areas is of a higher quality than the habitat right by the bunkers.

Q. Mr. Jim Polisini - Does that answer your question?

A. Mr. Ken Kloc - Yeah.

C. Mr. Jim Polisini - Okay.

C. Mr. Ken Kloc - Thank you.

Q. Ms. Diana Krevsky - Along in the same area, there was mentioned some other chemicals of concern or potential concern in the uplands magazine area, and there's a whole list of them in the report, and then it just kind of disappears. I wonder what happened. Are they not of any concern at all? I can list the ones that are down here. I don't even know what they are.

Q. Mr. Jim Polisini - Is that for the eco-risk assessment?

A. Ms. Diana Krevsky - This is the remedial action plan, the RAP.

A. Mr. Jim Polisini - Yes, but there's a section for the human-risk assessment and a section for the eco-risk assessment.

Q. Ms. Diana Krevsky - This is for chemicals of potential concerns. Is that your area?

A. Mr. Jim Polisini - Well, it would depend on which sections. Basically I can tell you --

Q. Ms. Diana Krevsky - Development of remedial goals. Does that help?

A. Mr. Jim Polisini - I'd have to get the documents and look at it. And basically I can tell you that, for the eco-risk assessment, the major component of concern was lead.

C. Ms. Diana Krevsky - Okay. And I guess I'm not just staying with a eco-risk assessment, but just in general, there was a reference to these chemicals in the upland magazine as potential concern, but then nothing that refers to it thereafter. So I'm wondering if they weren't of any concern after all upon consideration.

Q. Mr. Chip Gribble - Diana, could you read that part so that I can --

Q. Ms. Diana Krevsky - Okay. So, you don't know it by heart?

A. Mr. Chip Gribble - So I know what I wrote.

- A. Ms. Diana Krevsky - If anybody has the report, it's page 19, and it's under Development of Remedial Goals, and then it goes under Selection of Chemicals of Potential Concern. Selection of -- .

(Ms. Diana Krevsky reads:) Some are based on analytical data obtained during July 1996 with the sampling in this area, and then you go through the process of -- but based on the above process, chemicals were retained as COPCs, chemicals of potential concerns, for the upland at magazine area and golf course area. Seven metals were identified for the upland magazine area. And it's antimony, chromium, lead, manganese, tin, titanium, and zinc. And then the COPCs for the golf course area were identified as arsenic, and then a whole group of unpronounceable ones. So identification and selection for the upland magazine and golf course areas was based on a comprehensive remedial investigation and environmental evaluation process in conjunction with the closure.

- C. Ms. Diana Krevsky - And then it just goes on, and it doesn't say what happens with those concerns.
- A. Mr. Chip Gribble - I --
- C. Ms. Diana Krevsky - I didn't understand.
- A. Mr. Chip Gribble - What I'm getting from you is that -- that the discussion in the RAP doesn't sufficiently explain how we dispensed with those chemicals --
- A. Ms. Diana Krevsky - Yeah.
- Q. Mr. Chip Gribble - -- concerned? I can't tell you offhand. Mike, do you recall that? That's probably not a document that you read before you came to this meeting to refresh your memory.
- A. Mr. Mike Wade - I did look at one of the documents for Area E awhile ago, and I think there were a number of compounds, but when you looked at the levels they were present at, they really weren't of concern for the kind of exposures we were expecting.
- C. Mr. Chip Gribble - We can look at that further and get back to you later. We'll probably have to go back and look at the document closely and see what we did with those chemicals.
- Q. Ms. Diana Krevsky - Okay. But basically I guess the question was were there any other chemicals that --
- Mr. Chip Gribble - -- that generated a risk?
- Ms. Diana Krevsky - Yes.
- A. Mr. Jim Polisini - I can tell you that, for the eco risk, which is the part that I worked on, that lead was the big driver up there, and we thought that was taken care of. There's a whole process that you go through where you look at what all the potential contaminants are and which ones might be of most concern, and then you kind of winnow them down to the ones that are the most important, and lead was the big driver.
- C. Ms. Diana Krevsky - Okay.

Mr. Chip Gribble - I apologize that we can't answer the question any better than that, but if I can just give a little perspective. There's a lot of paperwork that's been generated on these sites

over the years, and to put that all in our head for a meeting is quite a challenge. So some of the questions that you give us we're not prepared to respond sufficiently at a meeting like this, but we will go back and look at that and provide you with a response.

Ms. Diana Krevsky - Thank you.

Mr. Chip Gribble - Jim.

Mr. James O'Loughlin - Yeah, my name's James O'Loughlin. I have a one-page comment I want to submit now, and I want to reserve the right to submit further written comments between now and June 10, the end of the written comment period.

The first, there's basically three comments. A lot of the pages at the beginning of the initial study aren't numbered, the ones that cover the project background, so it's very hard to refer to them when you want to comment on some of the documents that were used in the background of the report.

Secondly, the checklist, the initial study checklist, there's items that have been gone through, and all of them have been checked no impact, often in conflict with the preliminary documents and other documents, such as the onshore and offshore ecological-risk assessments.

And then lastly, on the initial study, page 3, it mentions the risk from the rodenticide that contains arsenic, and the risks are glossed over, and it should be reexamined, and, secondly, if there is a significant rodenticide there should also be considered to have an effect on four different habitats or a fate in four different habitats, such as air on page 8; page 9, surface and groundwater; 8 and page 11, animal life; and page 20, public health and safety. And thank you for the opportunity to comment and holding the public meeting.

Q. Mr. Chip Gribble - Jim, as I understand it, you're commenting on the CEQA package, which is the initial study essentially. Is that correct?

A. Mr. James O'Loughlin - That's correct.

Mr. Chip Gribble - Okay. The purpose of the initial study is to evaluate whether or not the project that we are undertaking, has a significant effect on the environment. The project that we're undertaking in this case is the remedy or the proposed remedy is a land-use covenant or effectively a deed restriction to limit future use of the golf course.

So, in other words, the initial study is an assessment or analysis to evaluate this land-use covenant that we're proposing. Does this proposed remedy have a significant effect on the environment? Our view is that the act of imposing that land-use covenant does not.

The issue about whether or not the environmental investigation and that remedy is adequate for the contamination at the site, we would try to address those questions in our investigation documents, and the remedial action plan. So I don't know if that helps at all. Is that --

Mr. James O'Loughlin - No. Well, this is part of the state CEQA guidelines that comments on the draft initial study should be responded to after the written comment period.

Mr. Chip Gribble - Oh, we'll respond to your comments absolutely.

Mr. James O'Loughlin - Okay.

Mr. Chip Gribble - We are obligated to do that. I'm not sure how else to respond at this point on that comment. We'll look at your letter, and we'll try to provide a written response to that. Any other comments?

Q. Ms. Myrna Hayes - Chip, can you briefly tell us how the land-use covenant is going to work, what the mechanism will be to . . .

A. Mr. Chip Gribble - I'm not an attorney, but my understanding is that the way the property is recorded at the county assessor's office, the Navy cannot enter into that covenant with the State of California, and so in order to – Dan's looking at me quizzically. Maybe I got that wrong. Please correct me if I don't have it correct. So, in order to effect the remedy, we will enter into a memorandum of agreement with the City of Vallejo saying that, when the City of Vallejo receives title to the property, they will enact this land-use covenant.

So, at that point, with that memorandum of agreement in place with the City, that effectively acts as a remedy where we can then say all remedial actions have been taken. And then, at that point, we could approve a FOST, assuming the FOST has been found appropriate, approve the FOST (Finding of Suitability to Transfer) that the Navy puts out, which will then put the Navy in a position to be able to transfer the property to the City. Once the City gets the property, they are legally bound to implement the land-use covenant, which would run with the land, and that limitation would be in effect undoable without the approval of the State of California Department of Toxics. Did I get that right, Dan? Dan's nodding his head.

Q. Mr. Ken Barden - Ken Barden. Will the proposed land-use covenant cover the second nine holes also?

A. Mr. Chip Gribble - No, it would not. Because the pesticide issue of arsenic, in our view, never extended beyond the original nine-hole course. The application was that the arsenic comes from an arsenical pesticide application at the golf course. I don't think it's likely to figure that the Navy was applying that in general up on the hill. I couldn't imagine any purpose that they would have found in applying the pesticide elsewhere on the hill outside of the golf course.

So we think that the concern extends to the limits of the original nine-hole course, even though a larger property's going to go to that golf course developer, that we don't want to unnecessarily broaden the limitation on the property for no valid reason. However, when somebody has a golf course and they propose to redevelop that someday for townhouses or residential developments or school property or something else, that, to the extent that I understand real estate, there would be other forces that would come into play that would obligate a further investigation into the suitability of that property for that other use. We wouldn't necessarily be involved in that as a matter of course, but I think that would happen.

Any other questions on Investigation Area E? At this point, I suggest that we take a ten-minute break.

(There was a recess from 8:08 p.m. until 8:20 p.m.)

Ms. Myrna Hayes - I'm going to welcome you back to the public meeting. Welcome, Kay Woodson, from State Senator Wesley Chesbro's office. Thank you for being here. Our presenter is disappearing on us, so I'll conduct the meeting. Jerry and I have made a commitment to ourselves and to you that we really do want to get out of here by 9:00 tonight because we've held you over a couple of other evenings. So we may dispense with the focus group reports and just do our co-chair reports after this Area 1 presentation and questions, because the commitment I made to DTSC was I'd rather have this public meeting here and sacrifice our regular schedule than do it on another night. Okay. Chip, here you go.

Mr. Chip Gribble - I'll try to move a little faster here. By the way, people can make written comments and submit them to us tonight or through the mail. People can make verbal comments tonight. We will consider verbal comments, the written comments, and any way that you want to communicate to us your comments or questions, we will respond to them and we welcome them, particularly comments to the extent that our documents are not clear, that they don't make sense, or that the conclusions we reached are not supported in the text, like Diana's comment about the different chemicals of potential concern.

We will make changes to these documents to try to improve the readability and to strengthen our conclusions so that, as you read it, you can follow how we got to our end point and hopefully that you would then agree with us. Those kind of comments are particularly welcome. All comments are welcome, by the way.

Okay. Investigation Area A1, clean parcels, is a subset of Investigation Area A1. In Investigation Area A1, there are two IR sites with considerable contamination that we carved out of the Investigation Area A1, clean parcels. They are boundary concerns, and what we did to make sure that the influence of those sites didn't cross over to A1, clean parcels, was a number of things, in particular a groundwater-plume analysis where we tried to delineate and project the extent of contamination from those sites over so many years.

And then we also extended that line to include a buffer for an extra margin of safety so that we would not have to be concerned with contamination coming from those two sites. Specifically, this is right here on the map is IR 17, a former paint-manufacturing facility. Significant contamination there.

By the way, the Navy has done a removal action there, a soil removal action, which has reduced the risk, reduced the contamination. I don't believe that that's fully remedied, but the Navy has made progress in getting to the end point there. There is some groundwater contamination from that site extending some distances away from it, and we think that the

extent of the A1, clean parcels, provides a sufficient buffer zone and distance from that contamination at IR 17 so that the A1, clean parcels, will not be impacted.

The other site that has contamination is IR Site A, which is up here. It's a site with lead oxide contamination from a lot of spent batteries that were dumped out there. The Navy also has done an extensive removal action out there. I believe that the Navy thinks that probably is an adequate cleanup for final remedy, but we're certainly not at that point in agreement with them. We may someday, we may not, but that's still an open question in our minds, and so we've carved out those two areas in particular from the area that we're talking about today.

A third area or source of contamination is here, which is a former gas station, Building 99 -- UST Tank 993. There are four USTs, underground storage tanks, in that location, and there is groundwater, there is soil contamination at that location from the underground storage tanks. We haven't finished characterizing that site, but we also have added a buffer distance between that and the Investigation Area A1, clean parcels, which we think is adequate so that that contamination doesn't cross over within a reasonable period of time. And our projected time frame is five years.

Okay. Unexploded ordnance. This area also was evaluated for unexploded ordnance in the broad sense of the term. There were two shooting ranges in this general area of the shipyard that in many years past were a small-arms range and a skeet range. The small-arms range backstop existed outside of Investigation Area 1, and it's somewhere over in this vicinity over here. The place where they shot from is still in Investigation Area A1.

The unexploded ordnance program -- people did investigate that looking for evidence of bullets and -- and did some soil sampling, particularly out here at the backstop. Lead contamination was found, but that's for a different meeting and a different discussion since it's outside of Area A1, clean parcels. We think that the issue is no longer a concern for Investigation Area A1, clean parcels.

The next topic is Group 2 and 3 sites. As I said earlier, initially we had 24 IR sites for Mare Island. We call those the Group 1 sites. Later we went through subsequent rounds of site identification, and the sites identified in those phases were called Group 2 and Group 3 sites. In the A1, clean parcels, we have no Group 1 IR sites. We do have two outside, which I already discussed.

For the two Group 2 and 3 sites, there were two that were identified, domestic sewage pumping stations, Dom 1 and Dom 2. In other investigations we've done on the shipyard for utility systems, we found that the pumping stations are the most likely parts of those systems where we're likely to find contamination, as opposed to the runs or the utility lines themselves.

For the pumping stations, it effectively is a sink or a low spot in the system, and if you were

to find contamination anywhere in the system, it's most likely to be at domestic pumping stations. Both of these locations were found to have some contamination. We concluded that it was very limited contamination, and the extent of concentrations was not a concern.

Kelly, the next one, please. Again, the radiological surveys were done in this area. I believe there was one that I can recall where there was radiological contamination, and that's in Building 655. I'll try to point with my little finger on this big wall. 655 is that big gray block up there. Thank you, Wally Neville.

Here's building 655. To my recollection, there was radium contamination in part of this building. I think it was in this corner of the building. Our agreements with the Navy call for cleanup or removal of radium contamination down to levels that were indistinguishable with background. Radium is a naturally occurring radioisotope. Radium is naturally found, and it's radioactive. So in soil outside and in an uncontaminated location, there will be radium 226, which is a radioactive isotope.

However, it's also a nonnaturally occurring radioisotope, and it can be in levels that are above natural levels and represent contamination. So there was contamination at this location. The Navy, in every instance where radium contamination was found, the radium was removed so that the residual concentrations were indistinguishable from background. We can say that with certainty in the areas where they did have contamination because, in order to make that determination as indistinguishable from background, that required statistical analysis, which required a significant number of samples in order to do the statistical analysis. So that in itself requires a significant survey and sampling of the site to verify that it's indistinguishable from background.

The PCB program: there were a number of sites that were evaluated in this Investigation Area A1, clean parcels also. Some of these PCB contamination was found. In general, the sites where we found PCB contamination were limited in extent, and the Navy cleaned them up or did the abatement to levels that were below 1 part per million. The PRG, by the way, for PCBs is less than 1 part per million. I think it's .2 parts per million.

So you may be wondering why we didn't clean up to less than 2 parts per million, we're saying it's okay. The Navy's cleanup goal was less than 1 part per million, and we felt that many of these are so limited in extent that they don't represent a consequential risk at that concentration. So the risk is really dependent on not just the concentration, but also the extent of contamination.

Underground storage tank (UST) program. In the UST program database, there are four listings of sites within Investigation Area A1, clean parcels. Two of the sites were not located. One of the USTs was removed. That was a 2,000-gallon waste-oil tank, which we determined was not problematic. Another one, called UST Site 999, was a 6,000-gallon diesel-fuel tank which the Water Board and we also concluded was not an issue.

However, in reevaluating these, the two tank sites, 655 and 655-1, these two tanks -- in additional site inspections we found evidence that a tank may have been or was likely to have been located in that area. The Navy went back for it, which I believe was the third time to look for a possible UST in that vicinity, and was not able to find a UST once again.

However, on the third go-round, petroleum hydrocarbon contamination was found. It doesn't appear to be significant. The contamination is hydrocarbon only. And by the way, if we have hydrocarbon-only contamination, that does not fall under our regulatory authority, and that has been turned over to the Water Board, for final determination. Our determination is that that site is a hydrocarbon-only contamination site, and we are not regulating that particular site. The presence of hydrocarbon-only contamination does not preclude transfer in this case.

Lead in soil from lead-based paint. Again, there are a limited number of structures in Investigation Area A1. Because of our disagreement with the Navy about how to handle this issue in particular, or regulatory authority over this issue, the EPA in this case, instead of the Navy, they had their contractor at the time, Weston, go out and sample a number of the buildings in this area that we felt were representative of the most likely places to find lead contamination in soil from lead-based paint. Our conclusion was that that is no longer an issue for Investigation Area A1.

I don't think this is adequately discussed in the RAP. Also, that report by EPA and the EPA's contractor, Weston, talks about one building in particular. And now my numbers are fading in my head. This building right here.

Q. Ms. Myrna Hayes - 571?

A. Mr. Chip Gribble - Building 571: And the average concentration of lead from the samples around that building is something in the neighborhood of 850, and that's considerably over our screening level. We have written to the Navy saying that that one was unacceptable and they need to go remediate that, and the Navy came back to us and said, "Mr. Chip Gribble, that's not soil -- it's asphalt."

And we went back, and with further inspection, we agreed with the Navy that most of the surrounding area by that building is basically an uncompacted and weathered asphalt material, and what EPA's contractor had sampled was the dirt and the gravel coming off of the uncompacted asphalt. So the lead contamination is not in soil, but it's on the material, the asphalt material that surrounds the building, which is a different issue for us, and that is no longer considered a concern by us.

Two other buildings had average concentrations at greater than 400 parts per million. I can't remember the building names, but there should be two U-shaped buildings. There's the other one right there.

Both of those had average concentrations greater than 400 parts per million; and, again, that

was brought to my attention the other day. I don't think that's adequately discussed in the RAP, and we're going to try to add some more discussion to the RAP to clarify that. The concentrations there, see 400 parts per million, there is soil around most of those buildings, but not all the way around them, No. 1. No. 2, when you get some distance away from the building, there is pavement around most of those buildings.

So when we look at the asphalt pavement, we conclude that under the asphalt pavement there is no lead contamination, that asphalt pavement was acting as the barrier. And if we remove the asphalt pavement and took samples at a distance, which effectively is a mid-yard sample, what we call a mid-yard sample, and average those out, that the more representative concentration of lead around those two structures falls well below 400 parts per million.

We don't have the data point to make that average, but we reasoned that that is the case, that the representative concentration would fall below 400. And the way that we are sampling for lead around buildings currently is to sample at every six feet along the side of the building and composite that sample and then average the concentrations to look for averages that are below 400 parts per million.

That sampling strategy removes our ability to see high concentrations or peak concentrations, but it does give us what we believe is a much more representative concentration of the general lead levels in that particular vicinity around that building. And so what we're looking for now is an average of those composites and looking for levels that are below 400 for our screening level.

So if we were to do that at these particular buildings, samples at drip line, then composite it, and then samples also at the mid area and composite it, and averaging those together, we can reasonably conclude that the average would be below 400. That was the basis for our determination at those particular sites.

If you'll go back to the impacts from nearby groundwater. I think I already went over that when we talked about the two IR sites that are outside of Investigation Area A1, clean parcels, but that have groundwater issues, and that we did an analysis to make sure that we had a comfortable distance between those sources and the extent of contamination and the line that we've established for this parcel that we're discussing tonight.

Greensand. This is an interesting one. The Navy did sandblasting for many years down at the south end of the island using material which was a nickel-sand material, and it has a very characteristic green look to it. Greensand is the common term. This material was disposed of out at that site, which is out at the south end of Mare Island, and that's another site called IR 4, green sandy beach. I think the developer wants to call it Emerald Bay.

And the material was disposed at that site. It was also disposed of at the landfill, which is another site that we're evaluating, IR 1. The material was also disposed of to some extent as a

backfill in utility lines. The Navy has made a case, which we think is a reasonable argument, that this material was used as a backfill in utility trenches for utility repairs, and based on our review of what the Navy has found to date, that our expectation of this greensand in utility trenches, we expect that it is located in discrete locations and in a limited number of concentrations throughout parts of Mare Island and utility systems. With the expectation that these are localized, limited deposits and few deposits, we feel that that presents an acceptable risk or not an unacceptable risk for unrestricted use.

And by the way, as the developers go in and develop these areas, we will know over time if our conceptual model isn't correct, and if that comes to be, that will be considered new information and we will go back to the Navy and say that determination is no longer valid because the developers and what we found subsequently is no longer consistent with our expectation, or if it is consistent with our expectation, then, obviously, we have no change.

Ambient concentrations of metals in the fill. This comes from the many decades of the Navy operating and generating hazardous waste and materials on the shipyard and with uncontrolled releases to the straits over the decades. This material, the sediment that collects in the strait was then routinely dredged and pumped out to the dredge ponds or the western side of the island, and a large part of Mare Island has been created through these dredging operations in Mare Island strait.

There were these releases out to the strait into the sediment of contaminants and then this contaminated material was dredged up and pumped out to the western side of the island. The question then is, in the fill material which composes most of the lowland area of Mare Island, is that, the fill material, in general contaminated ubiquitously, or the ambient concentrations of these metals in this fill material, did they represent contamination or are these ambient concentrations consistent with background or naturally occurring concentrations?

And the conclusion of the study we worked through with the Navy was that the ambient concentrations are consistent with levels that do not represent contamination. That's not to say we don't have contamination pockets, but the fill does not represent contaminated fill.

So, for Investigation Area A1, our proposal is for no further action in Investigation Area A1, clean parcels, that we think that what's there now is acceptable for unlimited use, unrestricted use, and that we do not propose any additional cleanup or limitation on the future use of that property. And that's the end of the presentation, and let's go to questions. Questions? Ken?

- Q. Mr. Ken Kloc - With regard to the ambient levels of arsenic, I recognize that you can't dig up the whole island and that those ambient levels are probably going to have to stay there, but nonetheless, as far as I know, that ambient level of arsenic is above the normal risk criterion, and so I'm wondering is there some way that there could be at least some sort of notification to people who are going to be using the land in the future? I'm not sure if you can do that in the CERCLA process. Probably not.

Or maybe there's some other way of doing it. I would imagine maybe if there was some mechanism in the EIS/EIR process, perhaps in mitigation.

- A. Mr. Chip Gribble - That's a good question. I don't have an answer for that. Mike?
- A. Mr. Mike Wade - In general, arsenic, all over the state of California, is higher than the one-in-a-million risk level. For the Bay Area, I see numbers that are usually around 10. So maybe it's a little elevated over parts of the Bay Area, but there's parts down in Southern California where it's higher. So even though over that risk level, I don't think it's an unusual amount for some parts of California.
- C. Mr. Chip Gribble - In a lot of these inorganic materials, there's a continuum or a range of concentrations where you can go from naturally occurring levels that are benign that are well within any risk numbers, and then there are other locations where basically they have monetary value as an ore body. And I think I'm out of my ability to speak on that as to how to handle those kind of situations where you have concentrations that are naturally occurring that represent significant risks and everything in between, from marginal risks to significant risks and how do we as a department handle or respond to that? And another question is, how do we as a society deal with that or respond to that? Steve?
- C. Mr. Steve Dean - Yeah, Chip, I was going to point out that arsenic is the one heavy metal that has a very similar risk assessment anomaly that radium does, and that radium 226, the typical background level for radium exceeds the upper end of our risk range. So we're more or less we're obliged to clean up radium to indistinguishable from background because we can't go any lower, even though the risk would want you to if it were possible.

So arsenic has a similar problem in that just naturally occurring levels of the arsenic are very high on our risk range. So it's an artifact we kind of have to live with in North America, or on the planet itself, so it's a very difficult question to grapple with, but we've had to with radiation – radium. I don't know if that helped or not.

Q. Mr. Steve Dean - Confused you all the more?

A. Ms. Myrna Hayes - No.

Mr. Chip Gribble - I'll certainly explore the options, when I get back to the office, with other people in my agency. And I don't know if it's appropriate for us to pursue some type of notification or not, but I'll look into that. Any other questions?

Mr. Chip Gribble - Diana?

Q. Ms. Diana Krevsky - You said that it was okay for unrestricted use. Does that include residential?

A. Mr. Chip Gribble - Unrestricted use is residential.

C. Ms. Diana Krevsky - Okay.

C. Mr. Chip Gribble - Anything goes. We're saying we don't believe that any limitation on the property is not necessary. Okay, Paula?

Q. Ms. Paula Tygielski - My question's about the buildings with the lead around them, and the

lead levels are -- in one case it's a matter of averaging it out. But those are unrestricted? Because in some of the other buildings, you put restrictions, like you shouldn't vegetable garden around the buildings.

Mr. Chip Gribble - I think you're referring to the CCC . . .

Ms. Paula Tygielski - The CCC.

Mr. Chip Gribble - -- down by, I forget what building number that is. That's down the southern end of the island.

Mr. John Cerini - H-1.

A. Mr. Chip Gribble - Pardon me? Building H-1? The California Conservation Corps has leased the building down in the southern end of the island, and they haven't purchased it or they don't own the property. That's a lease arrangement. They're subleasing from the city, who leases from the Navy, and that lease agreement, we put in limitations to prohibit growing vegetables for the people that were living there. That's a residential-lease property.

That limitation in the lease terms does not necessarily represent a final determination on my agency's part as to whether or not we think that's suitable for unlimited use or unrestricted use or that we think there should be some limitation there. We're just saying, for the purposes of this lease, you're not allowed to grow any vegetables. We haven't made a determination that the lead concentrations in that particular location are unacceptable or acceptable either way for unlimited use.

Q. Ms. Paula Tygielski - Okay. Now, these buildings that are in A1, they won't need a similar type of thing?

A. Mr. Chip Gribble - No. And best as I can recall from the CCC lease time, that we were uncomfortable with our understanding of lead concentrations in that particular location, and rather than go to the effort to develop a more complete understanding of the lead exposures that are possible down there, that we just wanted to put in that prohibition against growing vegetables.

Q. Ms. Paula Tygielski - And as a quick question, is the problem getting lead into the food supply, or is the problem with the person working the soil coming in contact with the lead that way?

A. Mr. Chip Gribble - Gee, I think it's . . .

C. Ms. Paula Tygielski - Or both.

A. Mr. Chip Gribble - I think it's both, but Mike Wade, do you want to add to that?

A. Mr. Mike Wade - Well, in our lead-exposure model, generally the garden adds insignificant amounts. So it's primarily the food, people consuming the produce, as opposed to gardening. Although, you know, that's going to add to your exposure as well, but it's primarily the food.

C. Ms. Paula Tygielski - Okay.

Mr. Chip Gribble - Okay. These documents are available for review at the information repository here at the library. That information repository is right across the hallway here, and I believe you just check at the reference desk. The close of the comment period will be June 10th. We

will prepare a response-to-comments document, and each commenter will receive a copy of this document and a copy will be placed in the information repository. That set of responses will be part of the record as we make our determination on the RAP. Dan, did you want to say something?

Mr. Dan Murphy - I know there was one gentleman here earlier tonight who made a comment, and he's now left. And for anybody else who has made comments, I think that pretty much everybody will recognize comments from this group, but I don't know who he was. And if anybody does and can tell us what his name was so that we can, A, make sure that the comments are properly attributed to him when they're responded to and, B, that he gets a copy of this, and for anybody else who isn't sure that we know what their comment was, the same thing goes.

Mr. Chip Gribble - And this is the fact sheet that we've put out covering these documents. I don't know if everybody got one or if anybody would like one. They're over on the sign-in table. So if you want to pick up one of the fact sheets, which I think gives a fairly concise overview of what we've discussed here tonight, please help yourself.

Any further questions? And then we'll end it. Okay. Again, I want to thank everybody for coming tonight to this meeting and taking time to provide us with your feedback and comments and be a part of the presentation here and helping us do our job. Thank you.

Administrative Business:

Mr. Jerry Dunaway - Thank you, Chip. I know we have limited time. What I want to do is go through my co-chair's report quickly. And I have some handouts for the board members, and there's some handouts going out to the audience also. Just going quickly through my handouts, I have my information on the front page there: E-mail address, U.S. mail address, phone numbers, and a list of acronyms for all the acronyms I'll be using today. And before I jump into that, Myrna just reminded me we need to conduct our normal business. If we have comments to the March 30 RAB meeting, two months ago, please submit those. Otherwise, we'll make those final after this meeting.

Reports:

Navy Co-chair

Mr. Jerry Dunaway - Back into my co-chair's report, the BCT report, basically, what the BRAC cleanup team has done in the last month. We had a meeting back on April 5th, and we have meeting minutes for that. And, Maria, could you pass them out . . .

Ms. Maria Villafuerte- Sure.

Mr. Jerry Dunaway - for the board members? There's some extra ones if the audience would like

to get a copy of those. We held a teleconference on May 15th, a couple weeks ago, primarily talking about the parcels and FOST. That's that Finding of Suitability to Transfer, and that's a subset of the Area E investigation that Chip talked about in the first part of his presentation. Future EPA participation, we also talked about that at length. Essentially we have resolved the apparent deficiency of EPA not participating in Mare Island's program. They will participate. Bonnie's not here tonight, but we have resolved the difference in budgeting between DoD and EPA. They will, however, potentially have a gap in coverage between now and the end of the fiscal year, September 30.

However, we will have someone from EPA permanently by October 1, 2000. We have an RPM meeting scheduled for June 13, and the tentative location is at DTSC. I think that is to be convenient for all the parties that are attending. This is open to the public. We're simply going to discuss briefs from regulatory agencies and from Navy RPMs. And the conversion management team meetings for May and June have been canceled. The city is not holding those. Jumping on to the second page, program status, what we're doing on the base.

The ordnance program. The ordnance Tiger Team, a process improvement team with a variety of players from the various organizations, met May 8 through May 12. They did a policy review, and they're reviewing model ordnance sites up and down the West Coast. Mare Island is a primary model site. It was attended by the Army Corps, Chief of Naval operations, NAVFAC headquarter staff, as well as Southwest Division staff. They did a tour of Mare Island and a program review on May 11 and 12, and the Tiger recommendations are forthcoming. They will be addressing further work at Mare Island.

Early transfer meeting was held on May 17, and that was really just a kickoff meeting. We talked a bit about early transfer over the last few months. I have some handouts, little booklets, that help describe the process of early transfer, and if I can have those passed around to the RAB members. They are helpful to get a preliminary understanding. Actually, the cover there shows the naval hospital in Long Beach. I spent several days there as a child, living in the Los Angeles area, and it's now a shopping center, and it's a testimony to really what transfer can do.

A draft FOST for Parcel 15 -- that's the clean parcels Chip just talked about -- that is going to be open for public review starting in June, so look out for that. We are currently in the public-review period for the Parcel 10 FOST -- That's the golf course, a subset of Area E -- and those comments from the public are welcome at this point. The public-comment period ends May 31, and for the RAB, I had mentioned some suggestions on how to get your comments. We want to hear from the RAB, and we want those comments. We can take them verbally, my E-mail address is on the front, or just general U.S. mail.

If I can skip to the next page, just some details. I list the environmental media, very similar to what the RAP states about Area E. These are the media that we studied for the golf course. And the second slide for that is a list of what resulted as the notifications of this FOST for

this golf course transfer. The significant difference is that we added two notifications to address historic structures.

Ken, to get back to your question, the bunkers are considered contributing historic structures, and they are subject to the memorandum of agreement with the state historic preservation officer. And two of those are currently being used as stormwater detention basins. The other ones that I'm not sure what the developer wants to do with those, or what the city plans to do with them, but I do believe they want to use them in a historic context.

Moving on to the fourth page, RAB support. We're proposing a tour on Friday, June 30, as well as Saturday, July 1. Both those are identical tours, and it's just two of them to offer flexibility for the RAB members for their ability to attend. RAB web site development. I list a web page here. If you go to that web page, you can click on support teams and click on environmental, and you'll see where we have web pages for various RAB sites. All the ones in Southern California are on there and fully developed. We're working to get all the Northern California RABs into that web page. Right now Hunters Point is in there. We'll get Mare Island in there within the next month.

And RAB support. Starting next month, we had some discussions about tracking attendance of RAB members for purposes of insuring we have consistent participation. Next month we'll start with a checklist for RAB members to check off to validate their attendance.

Information exchange. I had a couple of E-mails go out this past month, and for those who don't have E-mail, I made some hard copies here, and I'll pass them around for those who need them. And that's it. I have just a few items there for RAB presentations, and the TAPP Application No. 2 is in here for review. Let me pass it on to Myrna.

Community Co-chair

Ms. Myrna Hayes - Thanks, Jerry. I've just got a few items here. First, one of the decisions we made at the last RAB meeting was that I would prepare a letter to go to the Navy, the US EPA, expressing our serious concern about the budget snafu that occurred that caused Bonnie to transfer out. So Paula wrote her own letter, and that is here, and then there are hard copies of my letter.

And I want to acknowledge Rob Schonholtz and Diana Krevsky and Ken Kloc for making significant contributions and deletions from my original draft that improved that letter immensely.

I attended a meeting yesterday that Lennar put on for the Mare Island tenants, and I do have one copy of their land-use plan on a map if anybody wants to come up and take a look at it.

Going back to the funding issue, Bonnie has prepared a statement which she'd like me to read into the record, concerning that funding issue, and it says, "The EPA will continue to provide

regulatory oversight alongside the State of California for Mare Island. A new representative will be starting on the project in June. Navy headquarters has promised continued funding for fiscal year 2001. That's October of this year through September of 2001. There still is a high degree of uncertainty from the oversight budget starting in October 2001. At that time, our budget agreement expires. It is unclear if the agreement will extend for Mare Island and for the other military bases in EPA Region 9. Good luck, and I have enjoyed working with you."

And concerning the FOST, I want to alert the RAB members that, when you're looking at the January FOST versus the current FOST that's out for the golf course, it's really important that you note that the Navy has significantly altered their plan to assure that the golf course is not used for residential or other restrictive land uses. In other words, they removed all reference to their own initial commitment to making their own land-use covenant in their transfer from the Navy to the City, even though they note as a supporting document, from a final technical memorandum, that they can't assure that people would not be exposed to undue risk.

It's really important that you note in your comments that they've made that significant change and that that's not acceptable to you. At least that's what my recommendation would be, because in their original document they did say they would pursue a land-use covenant to insure that the golf course is not used for residential or less restrictive uses in the future, and they had actually also committed to not only a land-use covenant but also a notification and a quitclaim deed, which they have also chosen not to pursue, or there's no evidence of it anyway. So I just wanted to alert you to that particular issue. And I believe that is it.

Ken is probably running out of money for these wonderful goodies that he's been bringing. I forgot to pass the hat last month, and I also don't have a hat with me this month. I wish the regulators could take one of their hats off. And so if you want to put money in this cup as you go out, that would be great, because the Navy does not provide food for us normally. The only other item is that if anyone wants a copy of the "Western Stakeholders Forum of Land Use Control Federal Facilities Summary," put your name on the back of this letter, and I'll make you a copy. It was a very interesting presentation that I got a chance to moderate a panel on a few months ago, and this is just two or three pages. It also has a web site if you just want to write that down. It's in this letter here.

C. Mr. John Cerini - I have just one comment, since it may resolve before the next meeting. It's possible that the demolition of the residential units west of Tisdale may be approved before the next meeting. So I want to make sure and convey that.

Ms. Myrna Hayes - Something else that you might want to let us know about is, that in two or three weeks, the gate may not have a guard.

Mr. John Cerini - Well, the cameras will be installed within two or three weeks. We still have some signage that has to be put up, and then the gates will be removed from the guards during the daytime period, back at six at night, and there over the nighttime period.

Q. Ms. Myrna Hayes - One other issue along those lines, John. There are some new RAB members who do not have one of those red stickers you handed out that gives them some access to the island. Would they contact you?

A. Mr. John Cerini - Just tell me how many you need. I'll bring them to the next meeting.

Ms. Myrna Hayes - Okay. All right. Maybe people would need one -- I see Chip raising his hand.

Mr. John Cerini - Except for DTSC. I will get Chip one for sure.

Ms. Myrna Hayes - There's probably other things, but we've really had a difficult session. Unless there's some -- I mean hard work tonight.

Q. Mr. Ken Barden - Next meeting is when?

A. Ms. Myrna Hayes - Next meeting is June 29. That usually goes on the agenda. We should add that to it.

Q. Ms. Myrna Hayes - And, oh, I wanted to make one comment about the potential tour date, Jerry, and that is that that's the beginning of 4th of July weekend, and even though the 4th is on Tuesday, quite a few people may be taking that whole weekend off. So we may want to reconsider that date. Is there a show of hands of people who could not make that tour date? The rest of you will be here? Well, we'll maybe talk about that via E-mail.

A. Mr. Jerry Dunaway - We'll try another day.

Ms. Myrna Hayes - All right. Well, thank you to everyone, including Dan Murphy, who came out this evening, and we'll see you next month.

(The meeting was adjourned at 9:16 p.m.)

APPENDIX E

Responsiveness Summary to Public Comments



Department of Toxic Substances Control



Winston H. Hickox
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MARE ISLAND NAVAL SHIPYARD INVESTIGATION AREA E RESPONSIVENESS SUMMARY PUBLIC COMMENTS RECEIVED ON THE DRAFT REMEDIAL ACTION PLAN

I. INTRODUCTION

On May 25, 2000, the Department of Toxic Substances Control (DTSC) of the California Environmental Protection Agency held a public meeting at the JFK Library in Vallejo to present the draft Remedial Action Plan (RAP) for the Investigation Area E at Mare Island Naval Shipyard.

The purpose of the public meeting was to provide information to the public on the draft Remedial Action Plan (RAP) and to solicit public comments on the draft RAP. In addition, comments on the draft RAP were submitted to DTSC during the 30-day public comment period which extended from May 10 to June 10, 2000. A fact sheet that discussed the draft RAP and the proposed remedial measures for the site was mailed out on May 18, 2000. A public notice announcing the meeting were placed in the Vallejo Times Herald, the Fairfield Daily Republic, the Contra Costa Times, and the Benicia Herald, on May 10, 2000. Copies of the fact sheet and public notice are included in Attachment A to this Responsiveness Summary.

The draft RAP proposed a Memorandum of Agreement with the City of Vallejo which would require the City, upon receiving title to the property, to execute a land use covenant that would prohibit residential use and other sensitive uses for the original nine-hole golf course within Investigation Area E.

The verbal and written comments received during the public meeting and comment period are compiled and included in this Responsiveness Summary. The purpose of the Responsiveness Summary is to present a written response by the DTSC to these comments. The Responsiveness Summary and transcript of the public meeting are included in the final RAP.

This Responsiveness Summary is organized as follows:

- I. Introduction
- II. Public Comments received and DTSC Responses to Comments
- III. Attachment A: copy of fact sheet and public notice

A copy of the final RAP and other site-related documents are available for review at:

Department of Toxic Substances Control
700 Heinz Avenue, Suite 200
Berkeley, California 94710
510-540-3800

JFK Library
505 Santa Clara Street
Vallejo, California 94590
707-553-5568

Naval Facilities Engineering Command
900 Commodore Drive
San Bruno, California 94066
650-244-2520

II. PUBLIC COMMENTS RECEIVED AND DTSC RESPONSES TO COMMENTS ON THE INVESTIGATION AREA E DRAFT RAP

1. **Public Comment Received by letter: From Ms. Diana Krevsky. Letter dated 6/5/2000, providing comments on the Negative Declaration and the draft RAP.**

- a. **For the record, I favor institutional controls for the existing golf course in Area E and deed restrictions limiting the use to only golf or open space. My question is how long in terms of years will controls be legally required and who will be responsible for cleanup of the pesticides if golf no longer is the sport of choice in future generations? Will the DTSC regulate this periodically (beyond the five years mentioned) and is a system of compliance in place for the City of Vallejo to honor these restrictions for the duration?**

DTSC Response: The proposed remedy is a Memorandum of Agreement with the City of Vallejo and DTSC whereby the City, upon receiving title to the property, will execute a restrictive land use covenant that will run with the land. The restrictions will be permanent with title to the property. If a future property owner had other uses in mind and those uses were prohibited by the covenant, that owner could propose additional actions and, if approved by DTSC, could take on the responsibility to perform other cleanup and sampling to verify that other prohibited uses could then be acceptable. DTSC is required to conduct periodic reviews to ensure that public health and the environment are adequately and permanently protected.

- b. **Will further restrictions against digging wells or excavating soils be recommended?**

DTSC Response: The restrictive land use covenant includes a prohibition against drilling for resources such as water or gas, unless obtaining prior approval from DTSC. The excavation of soils will be subject to controls also defined in the land use covenant.

- c. **4.3.1 Selection of Chemicals of Potential Concern (COPCs): Clarify that the metals listed as COPCs in the upland magazine area are ordinarily present in soil and pose no health or environmental risk when used for recreational purposes, or, if these metals are a risk, mention whether restricted use is necessary.**

DTSC Response: All metals analyzed for and detected in the upland magazine area occur naturally in soils. The detected concentrations in the upland magazine area are generally consistent with the ambient/background concentrations established for metals in native soils at Mare Island. The human health and ecological risk assessments support a conclusion that environmental conditions in the uplands area are protective of human and ecological receptors for the intended reuse of this area as a regional park, as well as for other possible uses including

residential and without restriction.

2. Public Comment Received by letter: From Ms. Kelly Olin, California State Lands Commission. Letter dated 6/6/2000 providing comments on the draft RAP.

- a. Investigation Area E [legal descriptions] - Page 3, second course reading THENCE NORTH 82°48'04" EAST, A DISTANCE OF 561.80 FEET is out of order. It should be removed from its present location and follow the course reading THENCE NORTH 57°42'36" EAST, A DISTANCE OF 170.53 FEET.**

DTSC Response: The legal descriptions have been modified in accordance with the comment.

- b. Investigation Area E [legal descriptions] - The angles in the Original Golf Course description are rotated from those in the Record of Survey filed in book 21 of L.S.M. at Page 94, Recorded November 14, 1996, Solano County Records, and also from the angles in the description for Investigation Area E. As a result, in areas where it appears the two parcels share a common boundary, they do not. It also creates a situation where portions of the original golf course are outside the Investigation Area E, or portions of Investigation Area E that you may want to subject to the covenant will not be. In order to rectify this situation both descriptions should be tied to the same basis of bearing, i.e. U.S.C.&G.S. Semare, and "Mare Island Control Point, McGill, Martin-Self, Inc. Orinda, CA, #3.**

DTSC Response: The legal descriptions have been modified in accordance with the comment.

3. Public Comment Received by letter: From Mr. Jerry Dunaway, Navy BRAC Environmental Coordinator for Mare Island Naval Shipyard. Letter dated 6/12/2000 providing comments on the draft RAP.

- a. The Department of the Navy has reviewed this document and we have no substantive comments at this time. Thank you for the opportunity to comment on this document.**

DTSC Response: No response necessary.

4. Public Comment Received by letter: From Mr. Ken Kloc, ARC Ecology Environmental Analyst. Letter dated 6/7/2000 providing comments on the draft RAP and Negative Declaration.

- a. **ARC Ecology found the subject documents to be generally well written. However, we identified a number of areas within each document in which the DTSC's findings were not supported with sufficient discussion or analysis. In addition, we have discovered what we believe to be a significant problem with the agency's treatment of lead contaminated soil at both Areas E and A1. From our review of the subject documents, we are convinced that the DTSC needs to revise its policy on paint-based soil lead contamination at Mare Island. Our criticisms and opinions are described in further detail in the attached commentary.**

Thank you for giving ARC Ecology the opportunity to provide this input. We hope that our comments will help your agency craft the best possible remedies for the subject parcels.

DTSC Response: Comment noted. No response necessary.

- b. **Section 3.3, UXO Program: The UXO survey of Area E was carried out with less than 100% areal coverage. For example, the gullies along the roads leading to the UXO bunkers were not fully surveyed. The DTSC should provide additional discussion to justify its opinion that, "there was no further concern with UXO".**

DTSC Response: The survey plan for the uplands magazine area was based on a conceptual model based on historical use and other relevant information. Briefly, the Navy did dispose of a lot of old and obsolete ordnance items at Mare Island. The common practice was to dispose of this material in ways that were considered safe in the past, i.e. under water such as overboard into the Mare Island Strait and offshore/nearshore burial. Through dredging practices, ordnance items were also distributed into the dredge disposal pond areas. Because a relatively thin soil cover exists over weathered bedrock in the uplands area and because of the historical Navy concern for "safe" underwater disposal, it is unlikely that old ordnance items were disposed of or buried in this area, and if so, it would have been relatively shallow burial and readily detectable with geophysical surveys even considering the current technology limitations. Our conceptual model placed a somewhat higher level of concern (although still relatively low) along and near roads and rail lines in the uplands area. All roads and rail lines were searched, including a 70 foot swath centered on each, and were subjected to a 100% magnetometer search. Also, the base of steep slopes adjacent to steep roads were subjected to a 100% search where it was considered possible that ordnance thrown from a vehicle could have rolled downhill and come to a rest. Further, a 25 foot area around each above ground magazine was also subjected to a 100% magnetometer search. The majority of the buried magazines in the upland area have only a portion of their perimeters exposed. Because it is improbable that ordnance was hauled up a slope adjacent to the magazines, a search was accomplished only on the front and exposed sides, except where the 70 foot swath along roads and rail lines defined more extensive surveys. Further, the Ordnance Reservoir (a water reservoir not for ordnance storage), because it was

considered suspect for possible ordnance items at the bottom, was drained and investigated for magnetic anomalies. Finally, the results of the survey produced no evidence of UXO or disposal sites within the uplands area. Given our conceptual model and the unlikelihood of UXO disposal in the upland area, and the results of a rigorous investigation given the level and scope of concern, we conclude that there is no reasonable basis to extend our concern regarding UXO in the upland magazine area, in contrast to a residual concern for other UXO study areas at Mare Island.

- c. **Section 3.7, Lead in Soil: According to the RAP Section 2.2, there are 27 buildings in Area E. Yet, Section 3.7 of the RAP discusses lead-based paint issues only for two water tanks in the area. More information should be provided on the lead paint status of the other structures and buildings in Area E.**

DTSC Response: Almost all of the buildings in IA-E are buried magazines with exposed parts of these structures existing as unpainted concrete. In addition to the two water tanks in the RAP, Two other structures within IA-E were investigated for lead in soil. The results for these structures, buildings 658 and 650, (the golf course clubhouse and a nearby storage shed) are presented in the referenced EPA report. The average concentrations of discrete samples were 338 ppm and 59 ppm, respectively, with no individual sample exceeding a 1000 ppm concentration.

This section of the RAP has been modified to include this additional information to better support our conclusion.

- d. **Regarding the Navy's "maintenance action" for lead-contaminated soils at Tanks 188A and 188B, ARC Ecology has at least three objections to the methods by which the Navy (in its Maintenance Action Report) and the DTSC (in the RAP) have decided that post-excavation lead concentrations are below the 400 ppm residential screening criterion.**

First, the Navy's confirmation samples at Tank 188A, Sectors 7 and 8, indicate the presence of a relatively large hot-spot, with post-excavation composite lead concentrations in the range of 600 and 700 ppm. Additionally, since the Navy's furthest assessment sample in Sector 8 contained 620 ppm of lead, the lateral extent of the hot-spot remains undetermined. In a future-residential scenario, it is possible that vegetable gardens and children's play areas could be located on top of the hot-spot at Sectors 7 & 8.

Second, the assessment samples taken at Tank 188B were insufficient for defining the lateral extent of contamination. Six out of the 8 sample sectors had composite concentrations greater than the 400 ppm screening level in the furthest radial sampling location. The most problematic example was Sector 6: Soil samples were

taken between the tank and a road passing through this sector. However, even though concentrations on the tank side of the road were as high as 2790 ppm, sampling was not extended to the opposite side of the road.

Third, the cleanup goal used for the tank areas was inconsistent with cleanup goals generally used for lead-contaminated sites at Mare Island. For example, the goal for the cleanup of lead at IR Site 08 was to remove all soils found to have lead in excess of the 400 ppm PRG level. However, the cleanup goal for the tank areas was to attain an overall site average of less than 400 ppm. This latter goal allows soil concentrations above 400 ppm to be left in place and is significantly less health protective than the usual Mare Island standard.

Based upon these problems, Arc Ecology recommends the following:

--Additional characterization of lead contamination is necessary at the area of Tank 188B

--The DTSC should insist that the Navy treat paint-derived soil lead at Mare Island as a CERCLA release. The appropriate CERCLA methods and standards should be used for the remedial investigation and response at these sites. In addition the technical review and public participation aspects of these projects need to follow CERCLA standards; the Navy's "maintenance action" approach does not provide for a sufficient degree of agency or public oversight.

--Some form of remedial action appears warranted at both the Tank areas; at a minimum, institutional controls will need to be implemented to protect humans from undue lead exposure in a residential setting.

--The DTSC has not provided a sufficient analysis at this stage to justify no action on ecological grounds. A more detailed ecological analysis for the potential impacts of lead is in order.

DTSC Response: Following a reevaluation of the Freshwater Tanks 188A and 188B site information, we conclude that the lateral extent of lead contamination was not adequately defined. We appreciate the commentor bringing this to our attention.

In response, seven additional composite samples were taken, one five-part composite sample for each octant where the outermost sample had lead greater than 400ppm. The following additional results were obtained:

- Tanksite 188A octant 8 sample result at 16 feet out from the base of the tank was 36ppm. The previous outermost data point value was 441ppm at the extent of the excavation out to 13 feet.

- Tanksite 188B octant 1 sample result at 18 feet out from the base of the tank was 90ppm. The previous outermost data point value was 517ppm at 15 feet.
- Tanksite 188B octant 2 sample result at 19 feet out from the base of the tank was 59ppm. The previous outermost data point value was 203ppm at the extent of the excavation out to 16 feet.
- Tanksite 188B octant 3 sample result at 30 feet out from the base of the tank was 110ppm. The previous outermost data point value was 474ppm at 12 feet. A paved pathway crosses through this octant beyond the 12 feet radius sample location and approximately 28 feet. This paved area is not identified in the Navy's maintenance action report.
- Tanksite 188B octant 6 sample result at approximately 25 feet out from the base of the tank was 420ppm. A paved pathway crosses through this octant and is shown approximately on figures presented in the Navy's maintenance action report.
- Tanksite 188B octant 7 sample result at 27 feet out from the base of the tank was 620ppm. The previous outermost data point value was 577ppm at 24 feet.
- Tanksite 188B octant 8 sample result at 28 feet out from the base of the tank was 320ppm. The previous outermost data point value was 596ppm at the extent of the excavation out to 25 feet.

With the additional data from the seven octants, we believe that we have adequate definition and characterization to make a determination with respect to the lead contamination at this location. We conclude that the location-wide averages for the two tank sites are below our screening level concentration of 400 ppm. Additionally, although several composite samples do exceed 400ppm, none exceed the single composite screening value of 1000 ppm. We recognize that this screening approach can allow for smaller localized areas with concentrations greater than 400 ppm. However, in this case these areas are of limited extent not inconsistent with the screening criteria.

It is our understanding that Freshwater Tank 188B will be demolished later this year. In consideration of the current residual lead concentrations in soil and of the potential for lead paint to be released to soil during demolition, we will require additional soil sampling to follow demolition of the remaining freshwater tank.

The residual lead concentrations in soil at the freshwater tanks in IA-E are not inconsistent with other sites at Mare Island, in particular where the Navy conducted a removal action IR-08, insofar as no other lead removal action site at Mare Island has been the subject of a RAP. The removal action at IR-08 was an interim action which, by process, may or may not be sufficient in terms of an future final RAP. Further, although DTSC does use screening levels and apply screening criteria, site specific information should be considered which may result in site specific screening criteria.

DTSC does consider lead in soil from lead-based paint to constitute a release to the environment subject to the California Health and Safety Code Chapter 6.8. However, DTSC being a State agency cannot define Federal law or regulation. The Navy does not agree with DTSC on this

issue and the Navy, in general, does not consider lead in soil from lead based paint as a release subject to CERCLA. However, the Navy in the case of the freshwater tanks in IA-E acknowledged a need to reduce lead contamination levels at this location but would not acknowledge State authority to the point of agreement on how to approach this issue in particular.

We disagree with the comment that insufficient analysis has been provided to justify no action for this area on ecological grounds. The impacted area around the tanks is limited in extent and does not represent a significant habitat. That is, the tanks are located adjacent to the golf course, a highly managed system that is cultivated to maintain desirable turf and tree species. Considering the location and limited area, a more detailed ecological analysis is not warranted.

The following is a presentation of the questions posed at the May 25, 2000 public meeting and the responses to those questions

Q. Mr. Dennis English - I have a question. You mentioned earlier that you have a hesitance. Did you do a preliminary endangerment assessment?

A. Chip Gribble - Because of the way a lot of this work was done when the shipyard was going through closure, the shipyard at the time had roughly 3,000 employees. It was going down all the time. The Navy was trying to keep them busy and productive, and some of the ways in which they wanted to do that was to use them in the radiological surveys and the unexploded ordnance work and the PCB-program work and the underground storage program, and we thought that was a good way to go.

We agreed with that, that that was a considerable resource, that if we worked with the Navy and their resources or the skills that that remaining workforce had, that we could benefit greatly from that. So what we did was we organized what you would ordinarily find as a PASI document, a Preliminary Assessment Site Inspection, or the state equivalent of a PEA document. Instead of having one nice, neatly packaged document with all those issues in it as a PEA or a PASI, we have several reports from each of these programs addressing the issues that were dealt with in that program.

If you take this collection of miscellaneous documents and you put them all together, you will have the equivalent of a PEA or PASI document, and in some cases the equivalent of an RI document depending on what levels of work was done to address the question at that particular location. For example, IR 22 was more of a PEA evaluation.

Mr. Dennis English - Well, I just believe that the PEA preliminary. . . . According to the state's preliminary endangerment process assessment, there's accountability to that study so that a person who has done the study is held accountable for any problems that may occur in the future. So it's just a suggestion ? if you go for the state's way of doing things, but I guess you already

went ahead and did it a different way, which hopefully there still is accountability for those who did the surveys, which are severe if you don't do it properly.

Q. Mr. Chip Gribble - Can you expand on your point of accountability?

A. Mr. Dennis English - Accountability would be if studies were done improperly, or I believe the county EPA people know what I'm talking about, and also the Department of Toxic Substance Control. They have rigid guidelines on how to do these assessments, and if it was a consulting firm or even public officials or a staff doing the work, they have to be certified in certain areas, and they also have to stand by their work, and the work has to be evaluated. And if there are some problems found through certain discrepancies or whatever, there are criminal and civil penalties. So I'm just trying to find out if that was what you did, but --

C. Mr. Chip Gribble - That's a good point. By the way, I work for Department of Toxic Substance --

Mr. Dennis English- Oh, great.

Mr. Chip Gribble - I wish the Navy were giving this presentation. As far as accountability goes, some of those requirements, such as people doing radiological surveys or radiological work in the State of California or ? if I may speak for DHS ? I shouldn't speak for DHS, but my understanding is that Department of Health Services requires that those people or those firms be registered or licensed with Department of Health Services of the State of California, for example.

The Navy's radiological workers and their radiological team were not certified. They were not required to be certified because they were ? if I understand this correctly ? because they're federal employees on the federal property on a military site, and that registration or legal requirement didn't apply to Mare Island.

As I understand it, those people who used to work in that program, who have now moved on to civilian sector and are now private contractors working on other military sites, are now required to be certified with Department of Health Services, but the essence of that requirement and those types of requirements is really to help ensure that the people doing that work are qualified. And in this case, we felt that they were extremely well qualified.

I would say that also for the unexploded ordnance program. These people were specialists. Their professional career for the most part was in military service dealing with ordnance. I can't come close to that kind of qualification myself. In some areas, the PCB program in particular, and the UST program, many of the people who were working in those programs were Navy people or former Naval shipyard employees who had gone through retraining programs and had some ability to do that work, or shall we say people within their program had the ability to do that work as other people were learning on the job.

So to the extent that we've approved this work, we think that it was done in some cases excellently and other cases satisfactorily. I wouldn't say excellent for everything. I don't think you would say excellent about my work for everything either, but we are comfortable in our conclusion. Any other? Ken?

Q. Mr. Ken Kloc - A couple of questions. In the upland magazine area, are those bunkers going to be demolished?

A. Mr. Chip Gribble - Well, I don't know officially. The developer who will get that property eventually, the golf course specifically, will keep some of those, if not all of them. And I don't know what he plans to do with them. I think some of them he's using for storage right now, but my understanding is that he's not going to be tearing them down. But that's really not for me to say. I don't know that for certain.

Q. Mr. Ken Kloc - And then, were there any lead-based-paint issues at those bunker structures?

A. Mr. Chip Gribble - For the most part, the bunkers are concrete, and they're mostly buried in the hillside or they're dug out of the hillside and then with a soil crown on top of it. So most of them have very little exposed concrete surface and very little exposed paint surface.

Q. Mr. Ken Kloc - And then one last question. In the negative declaration, it says that the environmental, or ecological-risk, assessment for the upland magazine area revealed potential ecological risks due to lead, and then it says DTSC considered several other factors and concluded that there was no significant ecological risk. And I was wondering if you could explain a little bit more what those other factors were.

A. Mr. Chip Gribble - If I may, Jim Polisini is an eco-toxicologist from our department, and I'd like to refer that question to Jim, please.

A. Mr. Jim Polisini - I worked on the eco-risk assessment, the review of it anyway. Basically, what we looked at was the area at the top of the hill. The source of lead appeared to be those tags that Chip mentioned that were apparently torn off the bags or fell off the bags when the bags were taken out at the ammunition-storage area.

So what we looked at was, number one, what's the distribution of lead tags? And as Chip said, a lot of that soil was taken out. There was still some lead in the soil, but the distribution of lead concentrations was fairly spotty. I don't know how statistical you want to get about this, but there were some high areas and some low areas. And basically any ecological receptor, if it's like a mouse or something like that, is not going to stay in one place for its whole life. So it's going to move around. Even if it stays in the area of the ammunition, it's going to move around that. So its exposure averaged out over that area would be less than the maximum obviously.

And the other thing we looked at was bioavailability in that those tags would be elemental lead,

which is not as highly available as the lead used in toxicity experiments. So even if it, over a period of time, weathered and became more bioavailable, it's not going to be as toxic as the lead used in the experiments in the ecological-risk assessment.

So given those factors, we thought the bioavailability, the patchiness of the lead concentration, and the removal action, that those actions were sufficient in terms of eco risk. Plus the habitat surrounding those areas is of a higher quality than the habitat right by the bunkers.

Q. Mr. Jim Polisini - Does that answer your question?

A. Mr. Ken Kloc - Yeah.

C. Mr. Jim Polisini - Okay.

C. Mr. Ken Kloc - Thank you.

Q. Ms. Diana Krevsky - Along in the same area, there was mentioned some other chemicals of concern or potential concern in the uplands magazine area, and there's a whole list of them in the report, and then it just kind of disappears. I wonder what happened. Are they not of any concern at all? I can list the ones that are down here. I don't even know what they are.

Q. Mr. Jim Polisini - Is that for the eco-risk assessment?

A. Ms. Diana Krevsky - This is the remedial action plan, the RAP.

A. Mr. Jim Polisini - Yes, but there's a section for the human-risk assessment and a section for the eco-risk assessment.

Q. Ms. Diana Krevsky - This is for chemicals of potential concerns. Is that your area?

A. Mr. Jim Polisini - Well, it would depend on which sections. Basically I can tell you --

Q. Ms. Diana Krevsky - Development of remedial goals. Does that help?

A. Mr. Jim Polisini - I'd have to get the documents and look at it. And basically I can tell you that, for the eco-risk assessment, the major component of concern was lead.

C. Ms. Diana Krevsky - Okay. And I guess I'm not just staying with a eco-risk assessment, but just in general, there was a reference to these chemicals in the upland magazine as potential concern, but then nothing that refers to it thereafter. So I'm wondering if they weren't of any concern after all upon consideration.

Q. Mr. Chip Gribble - Diana, could you read that part so that I can --

Q. Ms. Diana Krevsky - Okay. So, you don't know it by heart?

A. Mr. Chip Gribble - So I know what I wrote.

A. Ms. Diana Krevsky - If anybody has the report, it's page 19, and it's under Development of Remedial Goals, and then it goes under Selection of Chemicals of Potential Concern. Selection of -- .

(Ms. Diana Krevsky reads:) Some are based on analytical data obtained during July 1996 with the sampling in this area, and then you go through the process of -- but based on the above process, chemicals were retained as COPCs, chemicals of potential concerns, for the upland at magazine area and golf course area. Seven metals were identified for the upland magazine area. And it's antimony, chromium, lead, manganese, tin, titanium, and zinc. And then the COPCs for the golf course area were identified as arsenic, and then a whole group of unpronounceable ones. So identification and selection for the upland magazine and golf course areas was based on a comprehensive remedial investigation and environmental evaluation process in conjunction with the closure.

C. Ms. Diana Krevsky - And then it just goes on, and it doesn't say what happens with those concerns.

A. Mr. Chip Gribble - I --

C. Ms. Diana Krevsky - I didn't understand.

A. Mr. Chip Gribble - What I'm getting from you is that -- that the discussion in the RAP doesn't sufficiently explain how we dispensed with those chemicals --

A. Ms. Diana Krevsky - Yeah.

Q. Mr. Chip Gribble - -- concerned? I can't tell you offhand. Mike, do you recall that? That's probably not a document that you read before you came to this meeting to refresh your memory.

A. Mr. Mike Wade - I did look at one of the documents for Area E awhile ago, and I think there were a number of compounds, but when you looked at the levels they were present at, they really weren't of concern for the kind of exposures we were expecting. [Note: this question was also submitted in writing. A more detailed response is provided under comment number 1c.]

C. Mr. Chip Gribble - We can look at that further and get back to you later. We'll probably have to go back and look at the document closely and see what we did with those chemicals.

Q. Ms. Diana Krevsky - Okay. But basically I guess the question was were there any other chemicals that--

Mr. Chip Gribble - -- that generated a risk?

Ms. Diana Krevsky - Yes.

A. Mr. Jim Polisini - I can tell you that, for the eco risk, which is the part that I worked on, that lead was the big driver up there, and we thought that was taken care of. There's a whole process that you go through where you look at what all the potential contaminants are and which ones might be of most concern, and then you kind of winnow them down to the ones that are the most important, and lead was the big driver.

C. Ms. Diana Krevsky - Okay.

Mr. Chip Gribble - I apologize that we can't answer the question any better than that, but if I can just give a little perspective. There's a lot of paperwork that's been generated on these sites over the years, and to put that all in our head for a meeting is quite a challenge. So some of the questions that you give us we're not prepared to respond sufficiently at a meeting like this, but we will go back and look at that and provide you with a response.

Ms. Diana Krevsky - Thank you.

Mr. Chip Gribble - Jim.

Mr. James O'Loughlin - Yeah, my name's James O'Loughlin. I have a one-page comment I want to submit now, and I want to reserve the right to submit further written comments between now and June 10, the end of the written comment period.

The first, there's basically three comments. A lot of the pages at the beginning of the initial study aren't numbered, the ones that cover the project background, so it's very hard to refer to them when you want to comment on some of the documents that were used in the background of the report.

Secondly, the checklist, the initial study checklist, there's items that have been gone through, and all of them have been checked no impact, often in conflict with the preliminary documents and other documents, such as the onshore and offshore ecological-risk assessments.

And then lastly, on the initial study, page 3, it mentions the risk from the rodenticide that contains arsenic, and the risks are glossed over, and it should be reexamined, and, secondly, if there is a significant rodenticide there should also be considered to have an effect on four different habitats or a fate in four different habitats, such as air on page 8; page 9, surface and groundwater; 8 and page 11, animal life; and page 20, public health and safety. And thank you for the opportunity to comment and holding the public meeting.

Q. Mr. Chip Gribble - Jim, as I understand it, you're commenting on the CEQA package, which is the initial study essentially. Is that correct?

A. Mr. James O'Loughlin - That's correct.

Mr. Chip Gribble - Okay. The purpose of the initial study is to evaluate whether or not the project that we are undertaking, has a significant effect on the environment. The project that we're undertaking in this case is the remedy or the proposed remedy is a land-use covenant or effectively a deed restriction to limit future use of the golf course.

So, in other words, the initial study is an assessment or analysis to evaluate this land-use covenant that we're proposing. Does this proposed remedy have a significant effect on the environment? Our view is that the act of imposing that land-use covenant does not.

The issue about whether or not the environmental investigation and that remedy is adequate for the contamination at the site, we would try to address those questions in our investigation documents, and the remedial action plan. So I don't know if that helps at all. Is that --

Mr. James O'Loughlin - No. Well, this is part of the state CEQA guidelines that comments on the draft initial study should be responded to after the written comment period. [Note: These comments were also submitted in writing and more specific responses are provided in the Responsiveness Summary for the Negative Declaration.]

Mr. Chip Gribble - Oh, we'll respond to your comments absolutely.

Mr. James O'Loughlin - Okay.

Mr. Chip Gribble - We are obligated to do that. I'm not sure how else to respond at this point on that comment. We'll look at your letter, and we'll try to provide a written response to that. Any other comments?

Q. Ms. Myrna Hayes - Chip, can you briefly tell us how the land-use covenant is going to work, what the mechanism will be to . . .

A. Mr. Chip Gribble - I'm not an attorney, but my understanding is that the way the property is recorded at the county assessor's office, the Navy cannot enter into that covenant with the State of California, and so in order to * Dan's looking at me quizzically. Maybe I got that wrong. Please correct me if I don't have it correct. So, in order to effect the remedy, we will enter into a memorandum of agreement with the City of Vallejo saying that, when the City of Vallejo receives title to the property, they will enact this land-use covenant.

So, at that point, with that memorandum of agreement in place with the City, that effectively acts as a remedy where we can then say all remedial actions have been taken. And then, at that point,

we could approve a FOST, assuming the FOST has been found appropriate, approve the FOST (Finding of Suitability to Transfer) that the Navy puts out, which will then put the Navy in a position to be able to transfer the property to the City. Once the City gets the property, they are legally bound to implement the land-use covenant, which would run with the land, and that limitation would be in effect undoable without the approval of the State of California Department of Toxics. Did I get that right, Dan? Dan's nodding his head.

Q. Mr. Ken Barden - Ken Barden. Will the proposed land-use covenant cover the second nine holes also?

A. Mr. Chip Gribble - No, it would not. Because the pesticide issue of arsenic, in our view, never extended beyond the original nine-hole course. The application was that the arsenic comes from an arsenical pesticide application at the golf course. I don't think it's likely to figure that the Navy was applying that in general up on the hill. I couldn't imagine any purpose that they would have found in applying the pesticide elsewhere on the hill outside of the golf course.

So we think that the concern extends to the limits of the original nine-hole course, even though a larger property's going to go to that golf course developer, that we don't want to unnecessarily broaden the limitation on the property for no valid reason. However, when somebody has a golf course and they propose to redevelop that someday for townhouses or residential developments or school property or something else, that, to the extent that I understand real estate, there would be other forces that would come into play that would obligate a further investigation into the suitability of that property for that other use. We wouldn't necessarily be involved in that as a matter of course, but I think that would happen.

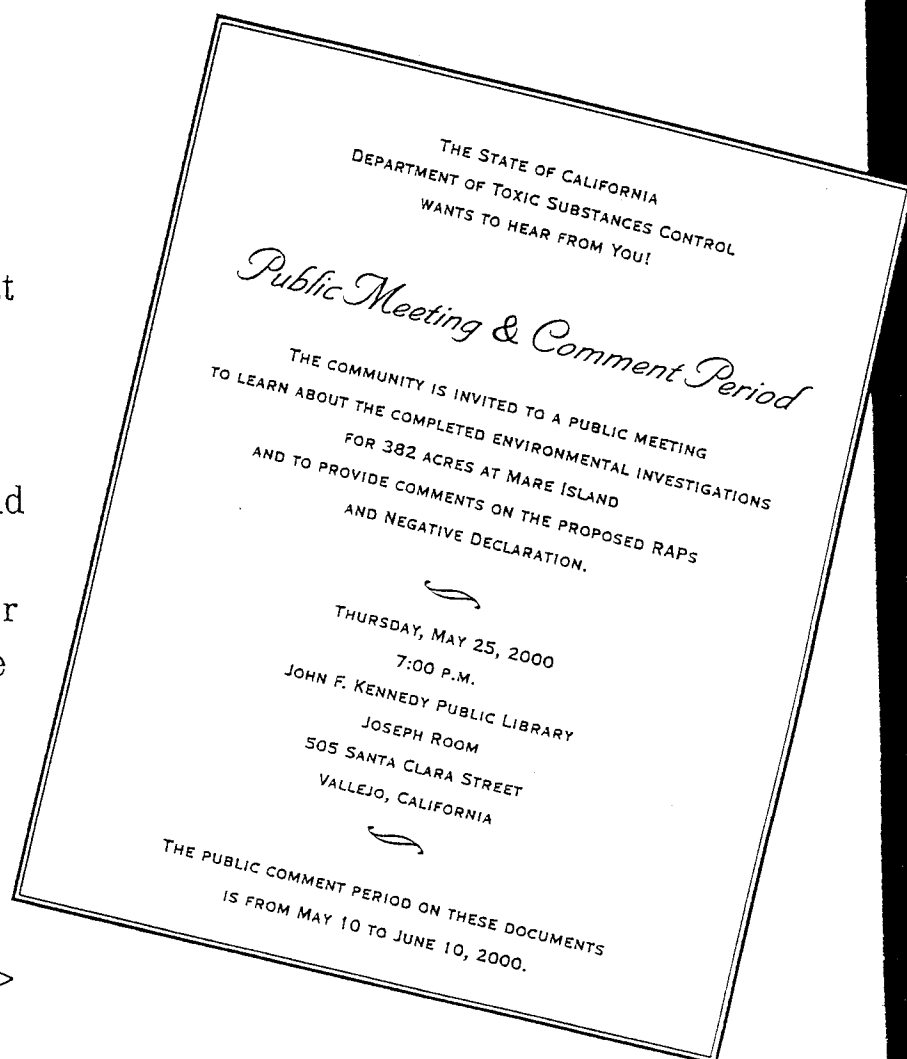
> > Mare Island Naval Shipyard < <

Environmental Investigations *Completed* for **382 Acres**

MAY, 2000

As part of the ongoing Installation Restoration Program (IR Program) at the former Mare Island Naval Shipyard, the U.S. Navy has completed an environmental investigation of 382 acres of land at the former Shipyard. The Department of Defense, in order to advance compliance with the Federal laws, established the IR Program to address hazardous waste contamination resulting from base operations at military installations.

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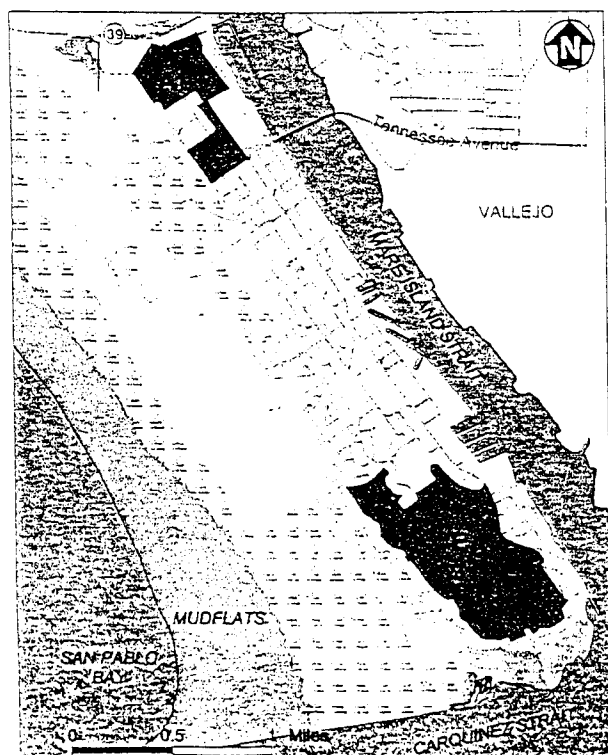


A thorough evaluation radiological contamination was conducted throughout Mare Island. In particular for IA-E and IA-A1 Clean Parcels, the surveys demonstrated that no radiological contamination exists in these areas.

The following is a summary of the investigations conducted at two Investigation Areas (IAs) at Mare Island Naval Shipyard. The investigations are summarized in two Remedial Action Plans (RAPs) prepared by the California Department of Toxic Substances Control (DTSC). Each RAP contains a description of the IAs suspected or known contaminants and the proposed remedial alternative for each area. The DTSC and the U.S. Environmental Protection Agency (USEPA) invites the community to comment on the investigations and the RAPs. The opportunities for public involvement and where to send comments are further described in this fact sheet.

Description of Land Investigated

The 382 acres of land investigated cover two land areas referred to as IA-E (285 acres) and IA-A1 Clean Parcels (97 acres). The following is a description of the historical and planned use of the property.



Investigation Area E

Historical Use: Golf course and ordnance storage

Planned Reuse: Golf Course (expanded from 9 to 18 holes) and regional park

Investigation Area A1 Clean Parcels

Historical Use: Industrial, ship assembly, construction and residential

Planned Reuse: Light industrial with some residential

Summary of Environmental Investigations

Both parcels were investigated for the following environmental concerns.

Unexploded Ordnance

As a result of past ordnance manufacturing, storage, and disposal practices, and operation of small arms ranges, all of Mare Island has been assessed for possible unexploded ordnance (UXO). In particular, both IA-E and IA-A1 Clean Parcels were investigated and surveyed for possible contamination. IA-E contains bunkers that were once used to store ordnance. Two small arms ranges were operated in the northern end of the island, part of which is within IA-A1 Clean Parcels. These areas were determined to be free of unexploded ordnance and related concerns.

PCBs (Polychlorinated biphenyls)

As part of a basewide effort, the Navy investigated these two IAs for transformer sites, electrical equipment storage areas, and other miscellaneous sites with a history suggestive of possible PCB contamination. One small transformer site in IA-E was found to have leaked PCB fluids and was remediated. Three small sites in IA-A1 Clean Parcels were found to have limited PCB contamination and were remediated. These remediated sites were

found to have a limited residual extent of contamination and at concentrations below the USEPA and DTSC site specific PCB screening level for unrestricted use. Therefore, it was determined that these sites do not pose a risk for unrestricted use.

Radiological Survey

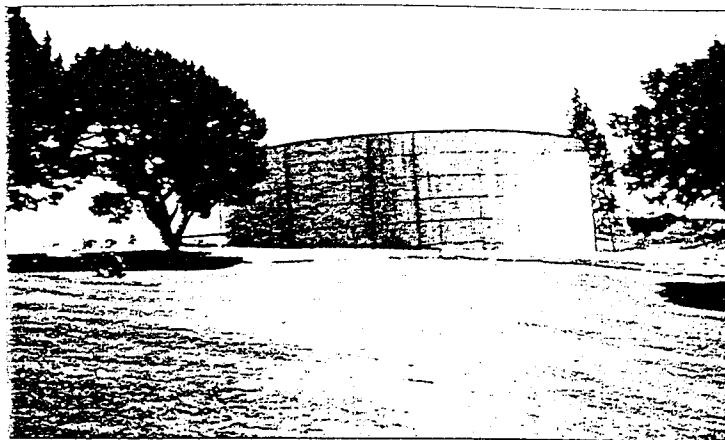
A thorough evaluation and survey for possible radiological contamination was conducted throughout Mare Island. In particular for IA-E and IA-A1 Clean Parcels, the surveys demonstrated that no radiological contamination exists in these areas. The surveys and reports were approved by regulatory agency oversight team of representatives from DTSC, USEPA, the California Regional Water Quality Control Board, and California Department of Health Services.

Underground Storage Tanks (UST)

Also as part of a basewide effort, the Navy reviewed all available information including shipyard records, past reports, and conducted basewide inspections to identify possible current and former UST sites. Within IA-E, five possible UST sites were identified. Of these five possible sites, only three were determined to have existed; two USTs were removed and the third was closed in-place as an old water cistern. These sites were determined to be low risk sites with minor contamination or were not contaminated as in the case of the water cistern. Within IA-A1 Clean Parcels, four possible UST sites were identified. Only two were determined to have existed; both of these USTs were removed. Subsequent investigation has determined that these sites have limited contamination from hydrocarbon only and also are low risk sites that do not warrant remediation.

Lead in Soil from Lead Based Paint

Mare Island has many structures that, because of past practices involving lead-based paint and maintenance of these structures, may have significant lead contamination in soil sur-



This photograph shows a view of the Mare Island Golf Course water tank 188A prior to assessment sampling.

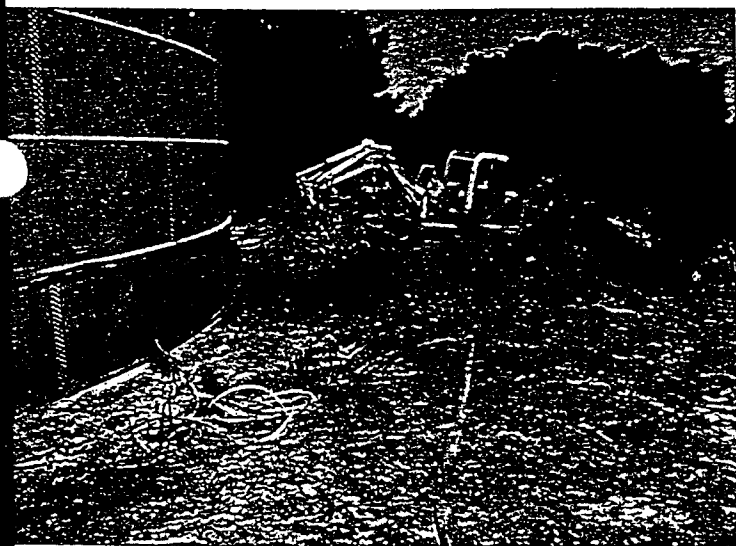
rounding these structures. A representative number of structures with the greatest likelihood of having lead contamination in the surrounding soil in these IAs were investigated and sampled. Most structures were found to have lead concentrations in soil that were above background but below screening levels protective of public health for unrestricted reuse. However, two aboveground freshwater tanks on the golf course were identified as having significant lead contamination in the surrounding soil. Contaminated soil around these structures was removed. The remaining concentrations of lead in soil at these sites are above background concentrations; but are within levels protective of public health for unrestricted reuse. Therefore, further remediation is not required.

At Mare Island, ships were blasted with sandblast abrasive to prepare the hulls for painting.

To differentiate naturally occurring metals from contamination at Mare Island, analyses were conducted to define background concentrations for Mare Island.

Assessment of Impacts from Nearby Contaminated Groundwater

Sources of contaminated groundwater and existing contamination outside of and in proximity to the IAs were assessed for potential to affect IA-E and IA-A1 Clean Parcels. IA-E is upgradient from contamination sources outside of this area. Sources of contamination do exist outside of IA-A1 Clean Parcels. However, groundwater monitoring data and modeling analyses of potential groundwater movement indicate that groundwater at IA-A1 Clean



This photograph shows an excavation of lead-affected soil at the Mare Island Golf Course water tank 188A.

Parcels will not be affected by the adjacent contaminated groundwater. The boundary of IA-A1 Clean Parcels was defined to include a buffer distance from existing contaminated areas outside of this area.

Greensand

At Mare Island, ships were blasted with sandblast abrasive to prepare the hulls for painting. Most of the spent sandblast grit was disposed of at the Mare Island landfill site and

near the sandblasting facility itself located in the southeastern part of Mare Island. A limited amount of the sandblast material was also randomly used as a backfill material in utility repair excavations at Mare Island. The predominant sandblast material used, commonly referred to as greensand, generally contains elevated levels of nickel, chromium, copper, zinc, lead, tributyl-tin, and PCBs. However, studies have demonstrated that the sandblast grit remaining as a backfill in utility corridors exists in small pockets in a limited number of localized areas, and as such, does not pose a risk to human health and the environment.

Ambient/Background Concentrations of Inorganic Metals in Soil

Several naturally occurring inorganic metals are also common industrial contaminants. To differentiate naturally occurring metals and naturally occurring concentrations of these metals from contamination at Mare Island specifically, analyses were conducted to define ambient and background concentrations for the original hill part of Mare Island and also for the lowlands largely created from historical sediment dikes and dredging. Arsenic concentrations in general were identified as being elevated throughout Mare Island but consistent with background concentrations, and thus, consistent with naturally occurring concentrations.

Golf Course and Pesticides

In IA-E, soil samples were taken for analyses from selected areas at the golf course most likely to contain chemical/pesticide residues from past Navy golf course operation. Elevated arsenic levels (from past pesticide applications) above background concentrations were identified and removed. Because other areas of the

DTSC has conducted an Initial Study for Area E and determined the draft RAP will not have an adverse impact on public health and the environment.

golf course are expected to have similar levels of elevated arsenic from past pesticide applications, and because the area will continue to be used as a golf course (including continued pesticide use), a covenant to restrict use of the golf course property has been proposed to prohibit residential development.

Conclusions

After an investigation of all potential environmental concerns, the DTSC and the EPA have proposed land use restrictions for the golf course area within IA-E and no further action for the remainder of IA-E as well as for IA-A1 Clean Parcels.

IA-A1 Clean Parcels is slated for transfer and redevelopment for light industrial and limited residential use.

IA-E is slated for transfer and continued use as a golf course and as a regional park. Because of historical use of pesticides and consequential arsenic contamination at the golf course, the land use restrictions will be implemented to ensure that future use of the golf course area will be limited to prohibit residential reuse.

Public Comment Period

Public comments on the RAPs for IA-A1 Clean Parcels and IA-E, and the Proposed Negative Declaration are being accepted from May 10, 2000 to June 10, 2000 and should be sent to: Department of Toxic Substances Control, attention Chip Gribble, Project Manager 700 Heinz Avenue, Suite 200, Berkeley, CA 94710-2721. All public comments will be carefully considered by DTSC before the RAPs are finalized.

Response to Public Comments

At the close of the comment period, DTSC will prepare a response to comments document. Each commentor will receive a copy of the response to comments and a copy will be available at the DTSC Berkeley office and placed in the information repository at the John F. Kennedy Library for public review.

California Environmental Quality Act (CEQA)

In compliance with CEQA, DTSC has conducted an Initial Study for Area E and determined the draft RAP will not have an adverse impact on public health and the environment and is proposing a Negative Declaration for this site. Public comments on the Negative Declaration may be submitted to DTSC's Berkeley office.

DTSC has also reviewed the proposed activities for Investigation Area A1 Clean Parcels and determined that this RAP is exempt from the requirements of CEQA under Title 14, CCR, Section 15061 (b) (3). The Notice of Exemption (NOE) will be filed which starts a statutory limitation to the time period for challenges to DTSC's CEQA determination for Investigation Area A1 Clean Parcels. A copy of the draft RAPs and the Negative Declaration for Investigation Area E are available for review in the information repository (JFK Library) and in DTSC's Berkeley office.

Where can the RAPs be reviewed?

The Remedial Action Plans (RAPs) are available at the information repository at the John F. Kennedy Library Reference Desk, 505 Santa Clara Avenue, Vallejo, CA 94590. Their number is (707) 553-5568. Community comments will be accepted until the close of business on June 10.

How You Can Get More Information About Environmental Cleanup

Attend the Public Meeting on May 25, 2000. As part of the monthly Restoration Advisory Board (RAB) meeting, the Navy, DTSC, and EPA will be presenting information and

answering questions regarding the Investigation Area 1A Clean Parcels and Investigation Area E RAPs. All interested parties are invited to attend the meeting and provide verbal or written comments. See the box below for more information.

Restoration Advisory Board (RAB)

The RAB is a forum for representatives from the Navy, state and federal regulators, and members of the community to discuss environmental cleanup at Mare Island. RAB meetings are held at 7:00 p.m. on the last Thursday of each month in The Joseph Room at the John F. Kennedy Public Library, 505 Santa Clara Street, Vallejo.

Meetings are open to the public and community participation is encouraged.

For more information about the Restoration Advisory Board, or to be added to the mailing list, you can call any of the Navy or regulatory agency representatives listed below, or you may also call the RAB Community Co-Chair Myrna Hayes at (707) 557-9816.

The Navy and regulators are available to answer your questions and discuss cleanup issues.

Patricia McFadden
Navy Environmental Liaison
650/244-2520

Jerry Dunaway
Base Realignment and Closure
Environmental Coordinator
650/244-2520

Chip Gribble
DTSC Remedial Project Manager
510/540-3773

Bonnie Arthur
EPA Remedial Project Manager
415/744-2368

Michael Rochette
RWQCB Remedial Project Manager
510/622-2411

Land Transfer Schedule The transfer of IA-A1 Clean Parcels and IA-E is scheduled for June 2000 and includes a total of 382 acres.

Notice to Hearing Impaired: You can obtain additional information by using the California State Relay Service at 1-888-877-5378 (TDD). Ask them to contact Chip Gribble at (510) 540-3773 regarding the former Mare Island Naval Shipyard.



**MARE ISLAND NAVAL SHIPYARD
PUBLIC COMMENT PERIOD MAY 10, 2000 TO JUNE 10, 2000**

Environmental Investigations Completed for 382 Acres at Mare Island

As part of the ongoing Environmental Restoration Program at the former Mare Island Naval Shipyard, the U.S. Navy has completed an environmental investigation of Investigation Area A1 Clean Parcels and Investigation Area E. In response to the Navy's investigation, the California Department of Toxic Substances Control (DTSC) has prepared two draft Remedial Action Plans (RAPs) for these locations. The RAPs include a summary of the environmental investigations conducted within these two areas of the Investigation Areas and the conclusions and proposed remedial alternatives for these locations. The draft RAPs propose No-Further-Action for Investigation Area A1 and a land use covenant for Investigation Area E. The land use covenant proposes to prohibit residential development at the former Mare Island golf course property.

California Environmental Quality Act (CEQA)

In compliance with CEQA, DTSC has conducted an Initial Study for Area E and determined the draft RAP will not have an adverse impact on public health and the environment, and is proposing a Negative Declaration for this site.

DTSC has also reviewed the proposed activities for Investigation Area A1 Clean Parcels and determined that this RAP is exempt from the requirements of CEQA under Title 14, CCR, Section 15061 (b) (3). A Notice of Exemption (NOE) will be filed which starts a statutory limitation to the time period for challenges to DTSC's CEQA determination for Investigation Area A1 Clean Parcels. A copy of the draft RAPs and the Negative Declaration for Investigation Area E are available for review in the information repository (JFK Library) and in DTSC's Berkeley office listed below.

Public Meeting and Public Comment Period

The public is encouraged to review and comment on the draft RAPs and the Proposed Negative Declaration during the public comment period from May 10, 2000 to June 10, 2000. Comments should be sent to: Chip Gribble, Department of Toxic Substances Control, 700 Heinz Avenue, Suite 200, Berkeley, CA 94710-2721. Comments will also be accepted during the community meeting to be held:

7:00 p.m.
Thursday
May 25, 2000
John F. Kennedy Public Library
Joseph Room

505 Santa Clara Street
Vallejo, CA 94590

An information repository containing copies of project documents has been established at the John F. Kennedy Library (address above). Please contact the Reference Desk at 707/553-5568 to review the documents.

For Additional Information Contact the Following

For further information about this project, please contact the following:

Chip Gribble
DTSC Remedial Project Manager
510/540-3773

Bonnie Arthur
EPA Remedial Project Manager
415/744-2368

Michael Rochette
Regional Water Quality Control Board Remedial Project Manager
510/622-2411

Notice to Hearing Impaired

You can obtain additional information by using the California State Relay Service at 1-888/877-5378 (TDD). Ask the service to contact Chip Gribble at 510/540-3773 regarding the former Mare Island Naval Shipyard.

